

KR Unexamined Patent Publication(A)

Bibliographic Data

IPC	H04L 12/00
Application No	10-2000-0067127
Application Date	2000-11-13
Open patent No	KR2002-0037124
Open patent Date	2002-05-18
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Title of Invention	DEVICE FOR TRANSMITTING VOICE AND IMAGE ON NETWORK AND METHOD THEREFOR

Legal Status

Date of request for an examination	20001113
Notification date of refusal decision	00000000
Final disposal of an application	registration
Date of final disposal of an application	20030121
Patent registration number	1003725250000
Date of registration	20030204
Number of opposition against the grant of a patent	
Date of opposition against the grant of a patent	00000000
Number of trial against decision to refuse	
Date of requesting trial against decision to refuse	
Date of extinction of right	

Abstract

The present invention relates to the voice and transferring multi-media data apparatus and method on a network in which the proper electrical transmission which fits for the network status of a user without the load which is large in a server even if users in which an intercast or the server providing the voice of one or a multi-channel and video data to the VOD (video on demand) broadcast to a plurality of users connected is increased made, and in the present invention is on a network, it is done by a feature to be users connected to a server made as to the voice and transferring multi-media data apparatus according to the network status of the step grouping user sending administration, transmitting encoded data, and especially comprises the buffer for and electrical transmission each user sending management group, and transmits or the multi-channel voice and video data in a coder and transmission buffer of a server, the voice transmitted from above statement step in the buffer for a coder and electrical transmission and the step encoding video data and stores, and the step transmitting data. The step transmitting data are encoded from above statement step and are stored to each user connected to a network through the grouped user sending administration.

Main Drawing(s)

Fig. 3

Keyword(s)

Frame data, data transmission, and an intercast.

Description

■ Brief Description of Drawing(s)

Figure 1 is a block diagram of the voice through a translator and transferring multi-media data apparatus of the conventional on a

network

Figure 2 is a block diagram of the voice through a server and transferring multi-media data apparatus in the conventional on a network

Figure 3 is a block diagram of the voice through a server and unit for video data transmission in the present invention on a network

Fig. 4 is the flow chart about the voice and transferring multi-media data method in the present invention on a network.

Figure 5 is a flow chart of the coder encoding the present invention data and makes frame data

Figure 5a is a flow chart of a decides is a coder new with the present invention frame data have to be encoded

Figure 5b is a flow chart of a coder of case, it mingles the present invention key frame data and reference frame data and reference frame data encode

Figure 5c is an operation example diagram which whether it has to encode frame data or not determines being new in the present invention drawing 5b

Figure 5d is an operation example diagram adapting the condition 5 of the present invention drawing 5b

Figure 5e is an operation example diagram adapting the condition 5 of the present invention drawing 5c

Figure 6 is a detail flow chart which determines whether it need to encode frame data or not being new with the present invention

Figure 6a is an operation example diagram mingling key frame data and reference frame data in the present invention drawing 6

Figure 6b is an operation example diagram which applies the consideration 2 in the determination whether it need to encode with frame data or not being new with the present invention

Figure 6c is an operation example diagram mingling the present invention key frame data and reference frame data

Figure 7 is a detail flow chart in the storage frame data being new in the buffer for the present invention electrical transmission

Figure 7a is a frame data storage operation example diagram in the buffer for the electrical transmission adapting the present invention condition 4

Figure 8 is an user sending administration flow chart transmitting frame data to the present invention each user

Figure 8a is an operation example diagram of the user sending administration adapting the present invention consideration 5

Figure 8b is an art in the user sending management room applying the consideration 1 or the consideration 2 to the present invention drawing 8

Figure 8c is an user sending execution of management art additionally applying the consideration 1 or the consideration 2 to the present invention drawing 8a

Figure 8d is an user sending execution of management art additionally applying the consideration 4 to the present invention drawing 8

Figure 8e is an user sending execution of management art additionally applying the consideration 4 to the present invention drawing 8a

Figure 8f is an user sending administration operation example diagram additionally applying the consideration 4 to the present invention drawing 8b

Figure 8g is an user sending administration operation example diagram additionally applying the consideration 4 to the present invention drawing 8c

Figure 9 is a detail flow chart which determines whether next frame data which transmits exists or not of the present invention user sending administration

Figure 9a is an operation example diagram applying a multi-channel in the process of determining whether next frame data which transmits exists or not of the present invention user sending administration

Figure 9b is an operation example diagram applying the consideration 3 in process of determining whether next frame data which transmits exists or not of the present invention user sending administration

Figure 9c is an operation example diagram applying the condition 2 in the process of determining whether next frame data which transmits exists or not of the present invention user sending administration

Figure 10 is a detail flow chart of the process of determining whether frame data which user transmit in the user sending buffer when the present invention channel and user being determined exists or not

Figure 10a is an operation example diagram a decides applying the consideration 6 in the process whether has frame data which transmit in the present invention user sending buffer or not

Figure 10b is an operation example diagram a decides applying the condition 1 in the process whether has frame data which transmit in the present invention user sending buffer or not

Figure 10c is an operation example diagram a decides applying the consideration 6 and condition 1 in the process whether has frame data which transmit in the present invention user sending buffer or not

Figure 10d is an operation example diagram a decides applying the condition 3 in the process whether has frame data which transmit in the present invention user sending buffer or not

Figure 10e is an operation example diagram a decides applying the consideration 6 and condition 3 in process whether has frame data which transmit in the present invention user sending buffer or not

Figure 10f is an operation example diagram a decides applying the condition 1 and condition 3 in the process whether has frame data which transmit in the present invention user sending buffer or not

Figure 10g is an operation example diagram a decides applying the consideration 6, and the condition 1 and condition 3 in process whether has frame data which transmit in the present invention user sending buffer or not

■ Background Art

The present invention relates to the voice and transferring multi-media data apparatus and method in on a network, more particularly, to the voice and transferring multi-media data apparatus and method in on a network in which the proper electrical transmission which fits for the network status of a user without the load which is large in a server even if users in which an intercast or the server providing the voice of one or a multi-channel and video data to the VOD (video on demand) broadcast to a plurality of users connected on a network is connected increase is made.

Generally, in on a network, it is positioned in the remote site which is physically apart from the server providing the voice and image data service and users provided the voice and video data are provided a service through a network.

And the real time protocol (real time protocol: RTP) is instituted as a standard by the network working group in order to effectively transmit multimedia data including the voice and image etc. through a network.

Therefore, in the real time protocol, each users provided data in the server providing data grasp the network status, for example, the network status, for example, data transfer rate 56k of a user, 200k, 300k etc. and it does not do. But after the translator (translator) (3) is put independently of the server (1) transmitting the voice and video data from the multimedia medium on a network to user (2) and the voice and video data which Jeon SongBat from the server (1) are decoded to as shown in Figure 1, it encodes into an again according to the network status delivering data and video data transmit.

In the server (1) independently of the server (1), this kind of transmission method had the efficient problem in the side including the cost and administration etc. in that it had to put the physically independent translator (3) on the network path to each user (2).

Moreover, in a server unlike transmission method described in the above, when it directly tries to process in consideration of the network status to each user, in order to reduce amount of data transmitted from a server to a network, it encodes into the various method and it transmits. Each user provided data which encoded is transmitted again decodes.

At this time, it is preferable that the network status to each users from a server that is a difference including the reaction speed I band width of a network, a stability etc can appear. Therefore, it controls amount of data which the network status to each users from a server that is a difference including the reaction speed I band width of a network, a stability etc encode according to the network status of each user and the network status transmits.

Therefore, as shown in Figure 2, it had the voice inputted within the server (1) providing the voice and image data service to users connected on a network as the number (1~n) of the user sending administration from each channel (1~m) and the problem the unable to providing the proper transport service for users problem needed the buffer for a coder as much as the number of channel (m) X usage (n) and electrical transmission in the server (1) as that, the user (n) connecting increased as the number of user who puts the buffer (1~n) for a coder and the electrical transmission encoding and stored, and but a method connects to a servers increased video data in the network status to appropriate amount and of increasing and giving the big load

■ Technical Task

Therefore, the object of the present invention groups in the server transmitting the voice of one or a multi-channel and video data to a

plurality of users according to the network status of each users and it separates. It puts the buffer for the coder of the bay and electrical transmission as this group number and although of appropriate amount increases, it does not give the big load and it transmits data by group in a server to a user. That is, the number of channel is a m and if the group number is a k, it has no concern with a usage, if it has the buffer for a coder as much as the number of channel (m) X group number (k) and electrical transmission, it becomes.

The present invention the purpose described in the above is realized is characterized that user sending administrations transmitting data which are users connected to a server as to the voice, inputted to users connected to a network from one or a multi-channel the voice, inputted from each channel within the server providing the image data service the voice and the transferring multi-media data apparatus encoding video data into appropriate an amount in the network status and is comprised of the buffer for a coder and the electrical transmission stored, and respective user sending administration transmitted to a user encoded data encoded according to the network status are grouped. The buffer for and electrical transmission is especially comprised each user sending management group and it becomes. Respective user sending administration transmitted to a user encoded data is stored in the buffer for a coder and electrical transmission.

Other invention is done by a feature for realizing a purpose to be made of the step transmitting or the multi-channel voice and video data in a coder and transmission buffer of a server, the voice transmitted from above statement step in the buffer for a coder and electrical transmission and the step encoding video data and stores, and the step transmitting data. The step transmitting data are encoded from above statement step and are stored to each user connected to a network through the grouped user sending administration.

■ Structure and Function of the Invention

Under the drawing which is the preferred embodiment of below the present invention attached, as described in detail, it is the same as that of the next time.

Fig. 3 is comprised of the server (30), the buffer (32) for the voice inputted from each channel within the server (30) and coder (31) and the electrical transmission encoding and stores video data in the network status to appropriate amount, and the user sending administration (33) transmitting data. The server (30) is the control block diagram for the transferring multi-media data apparatus and present invention voice, and provides the voice and image data service to users connected to a network. The user sending administration (33) transmitting data are connected to the buffer (32) for the coder (31) and electrical transmission and group users according to the network status and are encoded.

Fig. 4 is made of the step (400), the voice transmitted from above statement step (400) in the buffer for a coder and electrical transmission and the step (410), and the step (420) transmitting data. The step (400) is the flow chart for the transferring multi-media data method and present invention voice, and transmits or the multi-channel voice and video data in a coder and transmission buffer of a server. The voice transmitted from above statement step (400) in the buffer for a coder and electrical transmission and the step (410) encodes video data and stored. The step (420) transmitting data are encoded from above statement step (410) and are stored to each user connected to a network through the grouped user sending administration.

As described above, the present invention is divided into the unit and the present invention is a frame one or the multi-channel image or audio data which is transmitted within the server (30) in the buffer (32) for the coder (31) and electrical transmission and is encoded encodes.

That is, it becomes the unit dividing data which are inputted in order to encode. It is encoded from a lot to frame data in the form of 2 kinds. It is encoded from one to key frame data. It is encoded from other one to reference frame data.

In case of key frame data, whereas it can be immediately decoded without the other information, data can be decoded only when it has data of the full frame in case of reference frame data.

Thereinafter, data is referred to encoded to name because of being frame data.

When the user sending administration (33) being bound with the group and transmitting or multi-channel data with the coder (31) and transmission buffer (32) of one per group one in a different user, point as follows was considered.

δ consideration 1: coder unnecessary, it does not encode input data. In case it does not have data which any more send to a user, it encodes.

Several frame data is encoded in δ consideration 2: δ consideration 1 application in consideration of the network status in advance in case the network status is good.

When δ consideration 3: multi-channel data is processed, the inter-channel frame data generation time is not different like the live program in an inter-channel in case the motive is important.

According to δ consideration 4: net work state, the transmission group is separated. If the network status of the user within each group is deteriorated or it is improved, the group is automatically reorganized.

By the separate storage for frame data which the during transfer is not being put and like that using the buffer (32) which by group is prepared for the electrical transmission, the memory use of the apparatus is reduced to δ consideration 5: per user.

In case it has one or more frame data, it can transmit on the buffer (32) for δ consideration 6: electrical transmission to a user the

recent thing is sent.

In the above, consideration 1,2,3,4,5,6s mentioned are the withdrawal and it selectively can apply one or a different to a system.

When the user sending administration (33) is bound with the group and frame data are transmitted with the buffer (32) for the coder (31) of one per group one and electrical transmission to a different user, it is important to comprehensively consider the different situation of each users and it properly, produce the key frame. Since key frame data reduce amount of data which this transmits on a network to therefore if possible minimally produce relatively that the size is big in comparison with reference frame data it is due to be desirable.

Of course, it therefore encodes into key frame data with disadvantage and that immediately, full frame data is needed when decoding in case of reference frame data it can transmit.

In the present invention, key frame data are produced in condition as follows.

In case it has the user who newly connects with δ condition 1 \bar{E} or the user does not have proper key frame data sent like the time passing the higher civil service examination which tries to watch the channel which a user does not look and listen in the initial electrical transmission of any kind of channel, the key frame is produced.

When δ condition 2 \bar{E} , δ consideration 3 \bar{E} is applied, the key frame is produced when multi-channel data is compared with the current time the generation time of data the motive is important like the live program in an inter-channel it processes, if it is greater than the predetermined time.

The frame data domain which a user sent on the buffer for the electrical transmission of the size restricted with δ condition 3 \bar{E} ***ed with novelty frame data. In case it does not have the key frame which recently is freshly generated, the key frame is produced.

When δ condition 4 \bar{E} , δ consideration 5 \bar{E} was applied, the frame data domain which a user sent on the buffer for the electrical transmission of the restricted size ***ed with novelty frame data. In case it does not have the key frame which recently is freshly generated, the key frame is produced.

δ condition 5 \bar{E} . key frame data is usefully used during a decoding. Therefore, key frame data are produced if reference frame data of the maximum fixation number is produced.

In the above, the condition 1, 2, 3, 4, 5 mentioned is a withdrawal and it selectively can apply one or a different to the apparatus.

The composition of group of the user sending administration (33) is comprised of the some kind method.

δ method 1 – manual selection \bar{E} .

According to the network status to the user connected on a network, it is the method choosing the group. When a user connects to a server, this knows its own network status and a user selects appropriate the group in the group prepared in advance.

The fixing \bar{E} after δ method 2 – auto select.

After a user checks out the network status to a user in a server in a connection and a user is assigned to appropriate group, a user is like that maintained in the group until a connection with a user is cut off.

The change \bar{E} after δ method 3 – auto select.

After a user checks out the network status to a user in a server in a connection and a user is assigned to appropriate group, the network status to a user is continuously checked among a connection and a user is dynamically moved to the proper group.

And the method for checking out the network status and good and judging the badness can divide into the direct method and the indirect method.

The direct with δ monitoring method 1 method \bar{E} .

It is good of the network status and the badness directly checks the per second transmitted average data amount through the band width (bandwidth), shown or the delay time (latency) etc. is the average time hanging on one electrical transmission.

The indirect with δ monitoring method 2 method \bar{E} .

δ condition 2 \bar{E} , δ condition 3 \bar{E} and the phenomenon that frequently requests the key frame in case the network status is not poor like δ condition 4 \bar{E} in the group in comparison with other user are shown among key frame producing conditions. Through this, it indirectly can know.

The price assembling one or the various the monitoring method and shows the network status of each user is gained to check out the

network status of a user and choose the group. This value shows that the network status is proportionally good, or this value shows that the network status is inversely proportionally good.

Each group has the minimum value and the maximum value showing the network status.

A user is allocated in the group in which this two values of the price showing the network status of a user gives in a range.

Fig. 5 is the flow chart of the coder encoding the present invention data and makes frame data. The drawing 5a the process sequence which whether fig. 5 has to encode new with the present invention frame data or not determines nes. And the drawing 5b is the flow chart of the coder of the present invention key frame data and the case of mingling reference frame data and encoding. The coder existing according to by group channel encodes inputted data.

Firstly, in the encoding process (410), the coder (31) is initialized (500). The voice and video data inputted through one or a plurality of channels are encoded into frame data (501). Encoded frame data as described above is stored in the buffer (32) for the electrical transmission. The process is again repeated and it stores in the buffer (32) for the electrical transmission (502).

In the encoding process (410), in case δ consideration 1E or δ consideration 2E is applied and data are not encoded, while performing the step (503) which whether need to encode new data or not determines whether or not after an initialization, It encodes.

When to encoding in the step (503) which whether need to encode new frame data as described above or not judges whether or not, all data are not encoded into the key frame in the coder (31) and it encodes through the reference frame, It is the step (504) which whether as shown in Figure 5b, it is necessary to have the key frame or not judges whether or not added. Key frame data or reference frame data performing the step (505), which encodes into key frame data according to the decision or not of above statement step (504) and the step (506) which encodes into the reference frame and is encoded from above statement step (505) (506) is stored in the buffer (302) for the electrical transmission. At this time, as key frame producing condition 5 kinds mentioned before is how assembled whether or not of the need Korean paper and key frame data anytime apply, it is determined.

As the operation example diagram adapting the consideration 1 of the present invention drawing 5b or the consideration 2, as shown in Figure 5b, the drawing 5c is the step (504) performing the step (503) which whether need to encode new frame data or not determines whether or not before the step (504) which whether it is necessary to have the key frame or not judges whether or not and whether it is necessary to have the key frame or not judges whether or not added. It stores key frame data or reference frame data performing the step (505), which encodes into key frame data according to the decision or not of above statement step (504) and the step (506) which encodes into the reference frame and is encoded from above statement step (505) (506) in the buffer (302) for the electrical transmission.

As the operation example diagram which the drawing 5d applies the condition 5 of the present invention drawing 5b, δ condition 5E is applied in the step (506) encoded reference frame data and the step (507); which the reference frame of the s is encoded to a consecutively, it determines and the step (508) which memorizes to store the reference frame encoded from above statement step (507) according to the coding determination in the buffer (302) for the electrical transmission or has to produce key frame data are performed.

As the operation example diagram which the drawing 5e applies the condition 5 of the present invention drawing 5c, it is the step (504) performing the step (503) which whether need to encode new frame data or not judges whether or not and whether it is necessary to have the key frame or not judges whether or not added. The step (508) which memorizes to store the reference frame performing the step (505), which encodes into key frame data according to the decision or not of above statement step (504) and the step (506) which encodes into the reference frame and is encoded from the step (507); which the reference frame of the s is encoded to a consecutively, it determines as the reference frame in the coding performance and above statement step (507) according to the coding determination in the buffer (302) for the electrical transmission or next has to produce key frame data is performed.

Fig. 6 is the detail flow chart which determines whether it need to encode new with the present invention frame data or not. The new coding need determination step (503) of data is made of the step (600) judging whether or not whether recent frame data which finally was generated was transmitted to any kind of user.

As key frame data in the present invention drawing 6 and the operation example diagram mingling reference frame data, when the drawing 6a does not encode into key frame data and it encodes into reference frame data, it performs the step (601) which determines whether it need to encode key frame data or not and if it is no need to encode key frame data, it is made of the step (600) judging whether or not whether recent frame data which finally was generated was transmitted to any kind of user.

The drawing 6b is the operation example diagram which applies the consideration 2 in the determination whether it need to encode with frame data or not new with the present invention. It performs the step (602) which whether the network status is good or not determines in the initialization state. If the network status was good as for above statement step (602), although it was one among frame data of a n, finally was generated frame data was already transmitted to a user or a user performs the step (603) which whether the drawing 6b transmits or not determines. And at this time, it was transmitted or it encodes frame data new if it is the during transfer. It does not encode if it is not so.

If the network status is not good, frame data of a n is encoded in advance. Therefore, whether new data need to be encoded by whether frame data which finally were generated were transmitted or not performing the step (600) judging whether or not or, determines.

As the drawing 6c is the present invention key frame data and the operation example diagram mingling reference frame data, all data are not encoded into key frame data in the drawing 6b. When it encodes through the reference frame, it is comprised of the step (601) which determines whether it has to encode key frame data new even in case it is necessary to have key frame data or not.

Fig. 7 is frame data which are new in the buffer for the present invention electrical transmission the detail flow chart in the storage. It performs the step (700) calculating the size of frame data which firstly it stores in the buffer for the electrical transmission. After it performs the step (701) determining a domain frame data which it freshly stores on the buffer for the electrical transmission, it performs the step (702) storing frame data in the buffer for the electrical transmission.

When data are not encoded into key frame data and it encodes into reference frame data, if when transmitting frame data to a user through a network, data which it is delivered in the buffer for the electrical transmission are copied in the memory of being allocated and a user does not use, a domain on the buffer for the electrical transmission of frame data which is the during transfer can be destroyed among a transmissivity with other frame data. In this case, it has to do. In case a user grows, it has the disadvantage that the memory used amount is too much to put the memory space which stores one frame data to the per user in order to avoid this.

As to the drawing 7a, as the frame data storage operation example diagram in the buffer for the electrical transmission adapting the present invention condition 4, reference frame data independently cannot decode to key frame data. It can decode data based on before transmitted data.

Therefore, in case the separate memory of transmitting frame data with the per user is not used, the step (700) calculating the size of frame data which stores in the buffer for the electrical transmission is performed. After the step (701) determining a domain frame data which freshly store on the buffer for the electrical transmission is performed, it has other frame data. Is in the used domain the step (703) which determines whether it transmits this to any kind of user or not is performed. At this time, if the domain of frame data which is to any kind of user with the during transfer is reused, the information about data sending for this user be lost. Data which next send have to be key frame data.

Therefore, the step (704) which whether key frame data exist in the buffer for the electrical transmission or not judges whether or not is performed. The step (705) which memorizes next to encode key frame data at this time, if it does not exist is performed. And the step (702) storing frame data stored in the buffer for the electrical transmission is performed.

At this time, the separate memory of transmitting frame data with the per user is not used the hour encoding all data into key frame data. And yet, the separate consideration is unnecessary since all data are key frame data.

In the meantime, if the process of being encoded and transmitting data stored in the buffer for the electrical transmission to each user connected to a network through the grouped user sending administration is explained, it is given frame data which next it sends from the transmission buffer shared in the group and the per user transmission control part transmits through a network to a user.

As the user sending administration flow chart transmitting frame data to the present invention each user, the step (800) which initializes this user sending management group firstly if a user connects through a network gets accomplished. It performs the step (801) which whether next frame data which thereafter fig. 8 transmits to a user exists or not determines.

At this time, if it has frame data sent to a user, the step (802) has been copy this frame data in the separate memory is performed on the buffer for the electrical transmission. The step (803) transmitting data which come with the heat to a user is performed. And while repeating the process if the step (804) which determined whether the network connection was cut off after the electrical transmission or not was performed and it did not cut, data are transmitted to a user. The user sending administration is completed if it was cut off.

As the operation example diagram of the user sending administration which the drawing 8a applies the present invention consideration 5, by the separate storage for frame data which the during transfer is note being put and like that using the transmission buffer which by group is prepared, the memory use of a system is reduced to that is, the per user.

So, the step (806) which not, has been copying in the step (802) has been copy this frame data on the buffer for the electrical transmission of fig. 8 in the separate memory but only has been knowing only the memory area is performed. After the step (803) transmitting frame data is performed, whether this frame data domain measured after the electrical transmission with electrical transmission halfway other frame data and it was used or not the step (807) judging whether or not is performed. If it at this time ***ed, the step (808) informing a user of data transmitted data which before send become wrong is performed. The step (804) where the connecting network determines *** is performed.

But if did not *** above statement, while the network connection state, that is, a connection determines ***, the next frame data transmission is continued.

In fig. 8, the drawing 8b is δ consideration 1E or the embodiment applying δ consideration 2E. The step (800) which initializes this user sending management group if a user connects through a network gets accomplished in the state where the network status is excellent. It performs the step (801) which whether next frame data which thereafter it transmits to a user exists or not determines.

At this time, if it has frame data sent to a user, the step (802) has been copy this frame data in the separate memory is performed on the buffer for the electrical transmission. The step (803) performing the step (809) which informs the log on before a use subsequently in order to whether frame data were used on the buffer for the electrical transmission or not or uses, give publicity and transmits frame data to a user is performed. After the step (810) which informs after the use of frame data is finished to be finished is performed, the step (804) where the connecting network determines *** is performed.

Figure 8c is an embodiment in the drawing 8a, δ consideration 1E or δ consideration 2E is applied. That is, as shown in Figure 8a, δ consideration 5E which reduces the memory use of a system by like that using the transmission buffer which does not put the separate storage for frame data which is with the during transfer and by group is prepared is applied to the per user. After δ consideration 1E or the step (809), which informs the log on before a use in order to whether frame data were used on the transmission buffer or not or uses, in order to apply δ consideration 2E give publicity and the step (803) transmitting frame data to a

user are performed, the step (810) which informs after the use of frame data is finished to be finished is performed.

As to the drawing 8d, 8e, 8f, 8g, a sinker is the step (811) measuring the network status in respective 8, 8a, 8b, and 8c after the electrical transmission of one frame data and checks out and automatically changes the network client group which is suitable for the network status.

Figure 9 is a detail flow chart which determines whether next frame data which transmits exists or not of the present invention user sending administration. Whether next frame data transmitted exists or not the decision step (801) is elementarily performed to the step (900) which judges whether or not whether next frame data which transmits exists in the buffer for the electrical transmission of a channel for a user or not.

Figure 9a is an operation example diagram applying a multi-channel in the process of determining whether next frame data which transmits exists or not of the present invention user sending administration. Elementarily, it previously transmitted, or the step (901) selecting the channel which next irradiates based on the channel irradiating as the i channel is performed. The step (902) which determines from the chosen channel i value as described above whether the processing of all channels was completed or not is performed. And it does not have frame data which the processing transmits if the processing of all channels was completed when determining from the channel i value.

But if the processing of all channels was not finished from the chosen channel i value as described above in the determination, the step (903) which determines whether it is the channel which a user watches in this channel i/6 or not is performed. The channel i/6 which it irradiates in order to consider the next channel if it is the channel which a user does not look and listen is again selected. The step (900) which judges whether or not whether next frame data which transmits in the transmission buffer of this channel to a user exists if it is the channel which a user looks and listen or not is performed. And if frame data which subsequently next It transmits are prepared, after performing the step (904) selecting the i channel as the channel sending, prepared frame data are transmitted in the i channel.

Figure 9b is an operation example diagram applying the consideration 3 in process of determining whether next frame data which transmits exists or not of the present invention user sending administration. It was the flow chart of the embodiment which it transmitted from the channel in which the generation time was most late in order to have in case of a multi-channel and fit the motive with an inter-channel. It previously transmitted, or the step (901) selecting the channel which next considers based on the channel which examined as the i channel is performed. The step (902) which determines whether the processing of all channels was completed when determining with the channel i/6 or not is performed. And the step (905) which determines whether the channel which sent at this time, if the processing of all channels was finished was determined or not is performed.

But if the processing of all channels was not completed, the step (903) which determines whether it is the channel in which a user watches the chosen channel i/6 or not is performed. In order to consider the next channel if it is the channel i/6 which a user does not look and listen, the processing returns to the step (901).

In the meantime, if it is the channel which a user looks and listen, the step (900) which whether it has next frame data transmitted in the transmission buffer of this channel to a user or not determines is performed. In order to consider the next channel if frame data which next it transmits are not prepared, the channel returns to the step (901).

But next, if frame data transmitted are prepared, the step (906) which determines whether it is late than the generation times of other channels or not the generation time of the channel i/6 so far considers is performed. The step (904) which selects the channel i/6 as the channel which next transmits if it is late than generation times is performed. In order to consider the next channel if it was not late on the other hand, it returns to the step (901).

Figure 9c is an operation example diagram applying the condition 2 in the process of determining whether next frame data which transmits exists or not of the present invention user sending administration. That is, in order to if it was different over the predetermined time, it was new, key frame data were produced when the motive in an inter-channel it has in case of a multi-channel is compared with the current time the generation time of frame data which is generated in order to fit, it memorized. It was the flow chart of the embodiment for transmitting from the channel in which the generation time was most late and much more, well maintaining the inter-channel synchronization even. It transmitted, or the step (901) selecting the channel which next considers based on the channel which examined as the i channel is performed. The step (902) which determines whether the processing of all channels was completed when determining with the channel i/6 or not is performed. And the step (907) which determines whether the channel which sent at this time, if the processing of all channels was finished was determined or not is performed.

But if the processing of all channels was not completed, the step (903) which determines whether it is the channel in which a user watches the chosen channel i/6 or not is performed. In order to consider the next channel if it is the channel i/6 which a user does not look and listen, the processing returns to the step (901).

In the meantime, if it is the channel which a user looks and listen, the step (900) which whether it has next frame data transmitted in the transmission buffer of this channel to a user or not determines is performed. In order to consider the next channel if frame data which next it transmits are not prepared, the channel returns to the step (901).

But next, if frame data transmitted are prepared, the choice time of channel i frame data and difference of the current time perform the step (905) which determines whether difference are smaller than the predetermined time T/6 or not. And the step (908) which memorizes next to produce key frame data at this time, if it is not smaller than T is performed.

But the step (906) which determines whether it is late than the generation times of other channels the generation time of the channel i/6 so far considers if it is greater than T or not is performed. The step (904) which selects the channel i/6 as the channel which next transmits if it is late than generation times is performed. In order to consider the next channel if it was not late on the other hand, it returns to the step (901).

Figure 10 is a detail flow chart of the step (900) which is the process whether frame data which transmit in the user sending buffer exist when the present invention channel and user were designated or not of determining. The step (1000) which whether is the initial electrical transmission or not judges whether or not is performed.

Here, *** means case, a user for the first time Jeons SongBat frame data after a connection in this channel by watching the channel which a user does not look and listen.

At this time, if it is the initial electrical transmission, the step (1001) which whether the transmission buffer is vacant or not determines is performed. It does not have next frame data which it transmits if the buffer for the electrical transmission is vacant. The step (1002) selected as frame data which transmit frame data of any kind of one on the buffer for the electrical transmission if it is not vacant is performed.

Here, the selection standard can have the various. For example, frame data most long generated in a former can be selected. Frame data which recently were most generated can be selected.

But the step (1003) which determines in case of being not initial electrical transmission whether frame data which next sent were prepared from frame data which a user previously transmitted or not is performed. It does not have next frame data which it transmits at this time, if it was not prepared. If it was available with above statement, the step (1004) selected as data which transmit frame data after being prepared is performed.

Figure 10a is an operation example diagram a decides applying the consideration 6 in the step (900) whether has frame data which transmit in the present invention user sending buffer or not. It selects as data which recently next most transmit a thing in case a different has frame data. It changes into the step (1006) selected as frame data transmitting frame data which recently are most the step (1002) which is done by frame data transmitting frame data of any kind of one on the transmission buffer generated on the transmission buffer. It is not initial electrical transmission. The step (1005) which determines whether frame data which recently are more generated than next frame data exist when it was prepared as next frame data or not is performed. The step (1006) selected as frame data which transmit frame data which recently are most generated on the transmission buffer if frame data which at this time, recently, are more generated exist is performed. And the step (1004) selected as frame data which transmit next frame data if frame data which recently is more generated does not exist is performed.

Figure 10b is an operation example diagram a decides applying the condition 1 in the step (900) whether has frame data which transmit in the present invention user sending buffer or not. When key frame data and reference frame data are mingled and reference frame data encode, the step (1000) which determines whether frame data which transmit from the buffer for the electrical transmission are the initial electrical transmission or not is performed and at this time, the step (1007) which determines whether it has key frame data in the initial watching of any kind of channel or not is performed. At this time, the step (1008) which memorizes to produce key frame data if it does not have key frame data is performed.

The step (1008) selected as frame data which next transmit this if it has key frame data is performed.

But the step (1010) which determines if it is not initial electrical transmission whether the transmission buffer domain of frame data which previously transmitted ***ed or not is performed. It do not have frame data which perform the step (1011) transmitting and conditions and see this user off since to transmitting in the next time from key frame data if it measured and it was used.

On the other hand, if did not *** above statement, the step (1003) which it determines whether it was prepared as next frame data or not is performed. If it was prepared as next frame data, the step (1004) selected as frame data transmitting next frame data is performed. And it does not have frame data which it transmits if it was not prepared as next frame data.

Figure 10c is an operation example diagram a decides applying the consideration 6 and condition 1 in the step (900) whether has frame data which transmit in the present invention user sending buffer or not. When it is not initial electrical transmission, it has key frame data which recently are afresh generated. It performs to the step (1015) which whether recent key frame data was generated than key frame data which recently it transmitted to a user or not determines. And then the step (1016) selected as frame data transmitting key frame data which recently are most generated is performed.

Figure 10d is an operation example diagram a decides applying the condition 3 in the step (900) whether has frame data which transmit in the present invention user sending buffer or not. That is, the frame data domain which a user sent on the transmission buffer of the restricted size ***ed with novelty frame data. In case it does not have the key frame which recently is freshly generated, the key frame is produced. Concretely, as to the procedure, it is the same as that of the next time. Firstly, the step (1000) which whether it is the initial electrical transmission or not determines is performed. The step (1007) which whether it has key frame data or not determines is performed in case of the initial electrical transmission. And it does not have frame data which it transmits in case it does not have key frame data. In case it has key frame data, most old key frame data or the step (1008) which it most selects as recent key frame data or frame data which next transmits appropriate key frame data is performed.

In case of being not initial electrical transmission the step (1010) which whether the transmission buffer domain of frame data which previously transmitted ***ed or not determines is performed. The step (1003) which it determines whether it was prepared as next frame data if it did not *** or not is performed.

If it was prepared as next frame data, the step (1004) selected as frame data transmitting next frame data is performed. It do not have frame data which it transmits if it was not prepared.

The step (1015) which determines whether recent key frame data was generated than key frame data which recently transmitted to a user if the transmission buffer domain of frame data which transmitted ***ed or not is previously performed. If the recent key frame was

generated, the step (1018) selected as frame data transmitting this key frame data is performed.

Above statement step (1009) which memorizes next to produce key frame data recently if the key frame was not generated is performed. Above statement step (1009) do not have frame data which in this case, it transmits.

Figure 10e is an operation example diagram a decides applying the consideration 6 and condition 3 in the process whether has frame data which transmit in the present invention user sending buffer or not. The frame data domain which a user sent to data which recently next most transmitted a thing in case a different had frame data which could send on the transmission buffer of a selection, and the restricted size ***ed with novelty frame data. In case it does not have the key frame which recently is freshly generated, the key frame is produced.

Firstly, the step (1000) which determines whether it is the initial electrical transmission or not is performed. The step (1007) which whether it has key frame data or not determines is performed in case of the initial electrical transmission. And it does not have frame data which it transmits in case it does not have key frame data.

The step (1016) selected as frame data which next most transmit recent key frame data in case it has key frame data is performed. The step (1015) which whether recent key frame data was generated than key frame data which recently it transmitted to a user in case of being not initial electrical transmission or not determines is performed. And at this time, if recent key frame data was generated, the step (1016) selected as frame data which next most transmit recent key frame data is performed.

The step (1010) which whether the transmission buffer domain of frame data which it previously transmitted ***ed if recent key frame data was not generated or not determines is performed. The step (1003) which it determines whether it was prepared as next frame data if it did not *** or not is performed. And if it was prepared as next frame data, the step (1004) selected as frame data transmitting next frame data is performed.

In the meantime, it do not have frame data which it transmits if it was not prepared as next frame data. In above statement step (1010), the step (1009) which memorizes next that the transmission buffer domain has to produce key frame data if the transmission buffer domain of frame data which transmitted ***ed is previously performed. It do not have frame data which in this case, it transmits.

Figure 10f is an operation example diagram a decides applying the condition 1 and condition 3 in the process whether has frame data which transmit in the present invention user sending buffer or not. In the drawing 10d, when δ condition 1E is additionally applied and it does not have key frame data in the initial electrical transmission, the step (1009) which it memorizes in order to produce key frame data in the next coding is performed.

Figure 10g is an operation example diagram which determines whether frame data which transmit are in the buffer for the electrical transmission for a user or not together applying the present invention δ consideration 6E, δ condition 1E and δ condition 3E. In the drawing 10e, when δ condition 1E is additionally applied and it does not have key frame data in the initial electrical transmission, the step (1009) which it memorizes in order to produce key frame data in the next coding is performed.

■ Effect of Invention

As illustrated in the above, the present invention is to provide the service of an optimum without the load which does not put a coder and transmission buffer as the per user within the server providing the voice of one or a multi-channel and video data to a plurality of users connected on a network, and yet, is big in the server system by encoding in order to group to the per user according to the network status and produce data of the proper size although a usage drastically increases.

Claims

■ Claim 1:

The voice and transferring multi-media data apparatus in on a network of the voice, inputted to users connected to a network from one or a multi-channel the voice, inputted from each channel within the server providing the image data service the voice and the transferring multi-media data apparatus encoding video data into appropriate an amount in the network status and is comprised of the buffer for a coder and the electrical transmission stored, and respective user sending administration transmitted to a user encoded data, wherein user sending administrations transmitting data which are users connected to a server encoded according to the network status are grouped, and respective user sending administration transmitted to a user encoded data is stored in the buffer for a coder and electrical transmission.

■ Claim 2:

The voice and transferring multi-media data apparatus in on a network of claim 1, wherein the user sending administration is bound with the group and the buffer for the coder of one per group one and electrical transmission are comprised and it becomes.

■ Claim 3:

The voice and transferring multi-media data method in on a network wherein it is made of the step transmitting or the multi-channel voice and video data in a coder and transmission buffer of a server, the voice transmitted from above statement step in the buffer for a coder and electrical transmission and the step encoding video data and stores, and the step transmitting data, and the step transmitting data are encoded from above statement step and are stored to each user connected to a network through the grouped user sending administration.

■ Claim 4:

The voice and transferring multi-media data method in on a network of claim 3, wherein in order to repeatedly execute the step that the step encoding the voice and video data and stores encodes and the step storing encoded data as described above in the buffer for the electrical transmission the step are made.

■ Claim 5:

The voice and transferring multi-media data method in on a network of claim 4, wherein it encodes after whether it encode new data in order to unnecessary, it does not encode data or not inspecting.

■ Claim 6:

The voice and transferring multi-media data method in on a network of claim 4, wherein in the step encoded as described above, whether it is necessary to have the key frame or not is made of the step judging whether or not, and the step that encodes the key frame in above statement step according to the determination or encoded into the reference frame.

■ Claim 7:

The voice and transferring multi-media data method in on a network of claim 4, wherein the step encoded as described above is made of the step that determines whether it need to encode new data or not, the step that encodes data, and the step that encodes the key frame in above statement step according to the determination or encoded into the reference frame, and the step that encodes data are new in above statement step judging whether or not when it being necessary to have whether it is necessary to have the key frame or not.

■ Claim 8:

The voice and transferring multi-media data method in on a network of claim 6 or 7, wherein the step inspecting the case of consecutively encoding the reference frame of the s after the step encoding the reference frame, and the step that memorizes that the reference frame has to produce the key frame in case of consecutively encoding the reference frame of the s in above statement step are included and it becomes.

■ Claim 9:

The voice and transferring multi-media data method in on a network of claims 5, 7 or 8, wherein finally it determines as whether or not in which generated recent frame data is transmitted.

■ Claim 10:

The voice and transferring multi-media data method in on a network of claim 5, wherein whether the step that determines whether it has the new data coding need as described above or not includes the step determining, and the thing, and the thing whether frame data which finally were generated were transmitted or not determines as whether or not.

■ Claim 11:

The voice and transferring multi-media data method in on a network of claim 5, wherein the step that determines whether it has the new data coding need as described above or not includes and becomes the step determining the network status, and the step that determines depending on whether it was the during transfer or one was transmitted to a user or not in case the network status was excellent in above statement step although it was one among frame data of a n finally was generated.

■ Claim 12:

The voice and transferring multi-media data method in on a network of claim 5, wherein it includes the step that determines whether it is necessary to have key frame data or not, the step that the network transfer rate enough determines in above statement step in case it is not necessary to have key frame data whether it is fast or not, the step that determines depending on whether it was the during transfer or frame data was transmitted to a user or not although it was one among frame data of a n finally the network transfer rate was enough *** generated in above statement step, and the thing which the step that determines whether it has the new data coding need as described above or not determines as whether or not, and as to the, recent frame data which finally is generated if the network transfer rate is not fast is transmitted.

■ Claim 13:

The voice and transferring multi-media data method in on a network of claim 3, wherein: the voice transmitted in the buffer for a coder and electrical transmission and the step encoding video data and stores are new in the buffer for the electrical transmission, it is made of the step calculating the size of frame data, the step grasping the domain used on the buffer for the electrical transmission calculated in above statement step, and the step storing frame data on the buffer for the electrical transmission; the step calculating the size of frame data the voice transmitted in the buffer for a coder and electrical transmission and the step encoding video data and stores add; and as to the step, the domain used in above statement step is grasped.

■ Claim 14:

The voice on a network and transferring multi-media data method of claim 4, wherein the step storing frame data on the buffer for the electrical transmission is made of the step that determines whether it transmits to any kind of user or not, the step that determines whether or not in above statement step if it is the during transfer whether key frame data exist in the buffer for the electrical transmission or not, the step that memorizes that it has to encode key frame data into the next if the key frame does not exist in above statement step, and the step storing key frame data memorized in above statement step in the buffer for the electrical transmission.

■ Claim 15:

The voice and transferring multi-media data method in on a network of claim 3, wherein: the step transmitting data which encoded is stored to each user connected to a network through the grouped user sending administration is made of the step initializing the user sending management group, the step that determines whether next frame data, the step that has frame data, the step transmitting data has been copy in above statement step to a user, and the step that determines whether the connecting network was cut off in above statement step after the electrical transmission or not; the step that determines whether next frame data above statement step transmits to a user exists or not; and the step that has frame data the step transmitting data which encoded is stored to each user connected to a network through the grouped user sending administration sends to a user in above statement step; and has been copying this frame data on the buffer for the electrical transmission in the separate memory.

■ Claim 16:

The voice and transferring multi-media data method in on a network of claim 3, wherein: the step transmitting data which encoded is stored to each user connected to a network through the grouped user sending administration is made of the step initializing the user sending management group, the step that determines whether next frame data, the step that has frame data, the step that above statement step transmits frame data on the transmission buffer from a domain, the step that judges whether or not whether the frame data domain measured in above statement step with electrical transmission halfway other frame data and it was used or not, the step informing a user of data data, and the step that the connecting network determines ***; the step that determines whether next frame data above statement step transmits to a user exists or not; the step that has frame data send to a user in above statement step; and looks into a domain on the transmission buffer of next frame data which transmits in order to reduce the increment of the memory used amount according to the user increase; and the step informing a user of data data before send if it measured in above statement step and transmitted data were used become wrong.

■ Claim 17:

The voice on a network and transferring multi-media data method of claim 15, wherein the step transmitting frame data in a user includes and becomes the step that was frame data used on the buffer for the present electrical transmission; and before using, informs whether it is a busy, and the step that informs to be finished with a use.

■ Claim 18:

The voice on a network and transferring multi-media data method of claim 16, wherein the step transmitting frame data in a user includes and becomes the step that was frame data used on the buffer for the present electrical transmission; and before using, informs whether it is a busy, and the step that informs to be finished with a use.

■ Claim 19:

The voice and transferring multi-media data method in on a network of claim 15 or 16, wherein the step that automatically changes the network client group which is suitable for the network status is included if the connecting network did not cut and it becomes.

■ Claim 20:

The voice and transferring multi-media data method the thing including a step in on a network with a feature of claim 15 or 16, wherein the buffer judges whether or not whether next frame data which the step that determines whether next frame data which transmits to a user exists or not transmits exists in the buffer for the electrical transmission of a channel for a user or not.

■ Claim 21:

The voice on the network which includes the step that selects as the i channel to a feature while it judges whether or not whether next frame data which transmits in the transmission buffer of this channel to a user exists if the processing of all channels was not finished in the step that determined whether the processing of all channels was finished in a step and the channel i/6 which was chosen in above statement step or not and the channel i/6 which was chosen in above statement step if it is the step that determines whether it is the channel which a user watches in this channel i/6 or not and the channel which a user watches in above statement step or not and transferring multi-media data method of claim 15 or 16, wherein the step that determines whether next frame data transmitted as described above exists in case of a channel or not previously transmitted with the basis; and it selects the channel which next irradiates based on the channel irradiating as the i channel.

■ Claim 22:

The voice and transferring multi-media data method in on a network of claim 21, wherein the generation time tries to transmit in consideration of the inter-channel motive from the most late channel; and the step that determines whether it was the channel sending determined or not, and the step that the generation time of the determination return channel i/6 determines whether it is late than *** channel up to date or not whether it has frame data transmitted in the transmission buffer of a channel for users or not are included if the processing of all channels was completed and it becomes.

■ Claim 23:

The voice and video transmission method in on a network of claim 22, wherein the step that a difference with the generation time of frame data and current time determine whether a difference are bigger than the predetermined time (T) or not, and the step that it memorizes next so that it is new, a difference produce key frame data in case a difference with the generation time of frame data and current time are big of above statement step are included in order to well fit the motive going with channel and much more, it becomes.

■ Claim 24:

The voice and transferring multi-media data method in on a network of claim 15 or 16, wherein: when the channel transmitting was determined, it is made of the step that determines whether it is the initial electrical transmission or not, the step that whether the transmission buffer is vacant or not determines in above statement step if it is the initial electrical transmission, the step that the step that determines whether next frame data, the step that determines in above statement step in case of being not initial electrical transmission whether frame data, and the step that the step that determines whether next frame data, the step that the step that determines whether next frame data, the step that the step that determines whether next frame data which transmit if above statement step is the buffer for the electrical transmission short; and it selects as frame data which transmit frame data of any kind of one on the buffer for the electrical transmission if it is not vacant; the step that determines in above statement step in case of being not initial electrical transmission whether frame data next sent were prepared from frame data which a user previously transmitted or not; and the step that the step that determines whether next frame data transmits to a user exists or not does not have next frame data which it transmits if above which it transmits if it was not prepared in above statement step and it does; and it selects as data which transmits frame data after being prepared if data was prepared.

■ Claim 25:

The voice and transferring multi-media data method in on a network of claim 15 or 16, wherein: the channel transmitting was determined; whether frame data which next it transmits from frame data which it previously transmitted to a user exist in case it mingles key frame data and reference frame data and reference frame data does not encode or not includes the step that the step that determines whether next frame data, the step that it inspects whether it has frame data, and the step selected as frame data; and it includes the step that determines whether recent key frame data was more generated than key frame data, and the step selected as next frame data transmitting key frame data in case it mingles key frame data and reference frame data and reference frame data encode; the step that determines whether recent key frame data was more generated than key frame data recently transmits to a user or not; and the step selected as next frame data transmitting key frame data recently are most generated if it was generated in above statement step.

■ Claim 26:

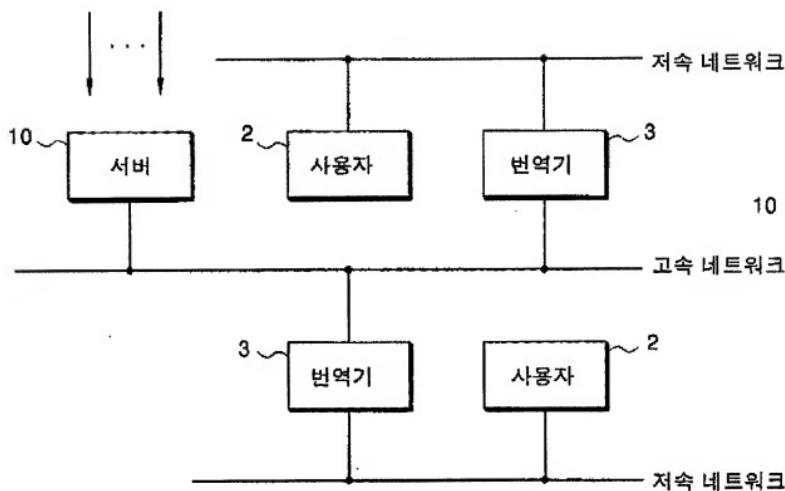
The voice and transferring multi-media data method in on a network of claim 15 or 16, wherein in the step that determines whether next frame data which transmits to a user exists or not, the channel transmitting was determined, it mingles key frame data and reference frame data and it encodes; it is the initial electrical transmission but the channel does not have key frame data; and it immediately encodes key frame data and a user does not wait to the coder (31) and it includes the step that decodes immediately, an image and audio data; and determines whether it is the initial electrical transmission, the step that determines in above statement step if it is the initial electrical transmission whether it has key frame data in the initial watching of any kind of channel or not, and the step that memorizes that it has to produce key frame data if it does not have key frame data in above statement step.

■ Claim 27:

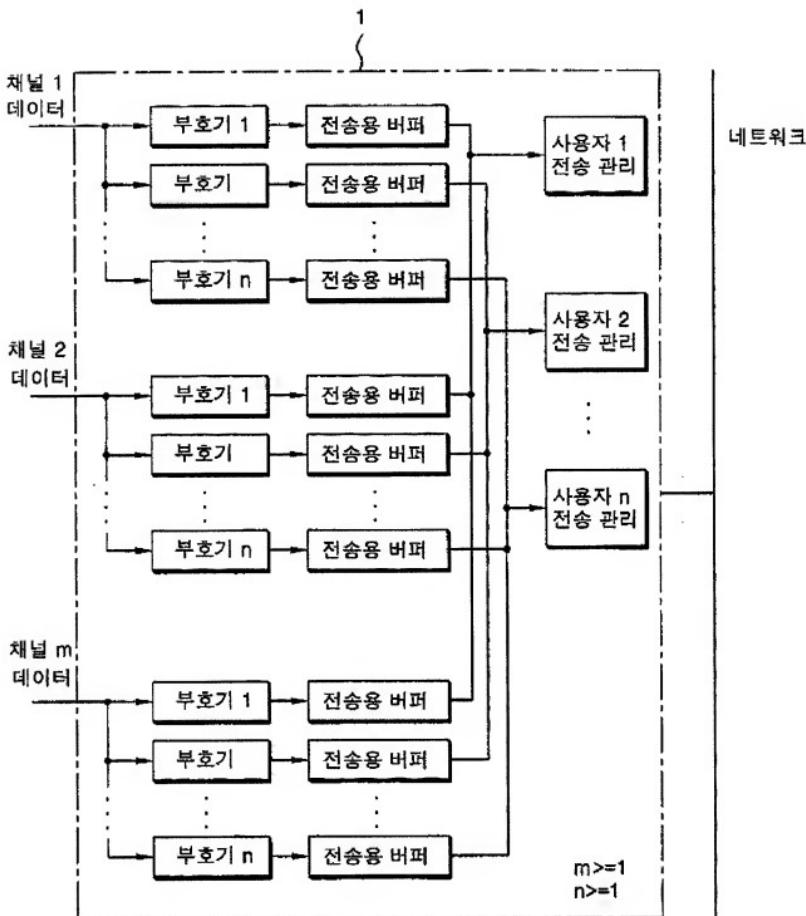
The voice and transferring multi-media data method in on a network of claim 15 or 16, wherein: the channel transmitting was determined; and it copies frame data which the increment transmits in order to reduce the increment of the memory used amount as a user increases with the separate memory from the buffer for the electrical transmission and it does not use and it has been knowing the memory area in which it has frame data which it only transmits on the buffer for the electrical transmission and it includes the step that transmits; and determines whether the buffer area for the electrical transmission of frame data, the step that or determines key frame data and the step that states the transmission state the initial electrical transmission in case of mingling reference frame data and nots encoding in case it measured in above statement step and it was used whether the step have key frame data, the step that the step that determines whether next frame data, and the step that it is done by frame data; the step that transmits; and determines whether the buffer area for the electrical transmission of frame data previously transmitted ***; the step that or determines key frame data and the step that states the transmission state the initial electrical transmission in case of mingling reference frame data and nots encoding in case it measured in above statement step and it was used whether the step have key frame data recently are generated than key frame data and key frame data which previously transmitted in case of mingling reference frame data and encoding or not; the step that the step that determines whether next frame data transmits to a user exists or not memorizes so that it produce key frame data to the coder (31) in case it does not have key frame data which recently are generated in above statement step; and the step that it is done by frame data next transmit this in case it has key frame data which recently are generated in above statement step.

Drawing

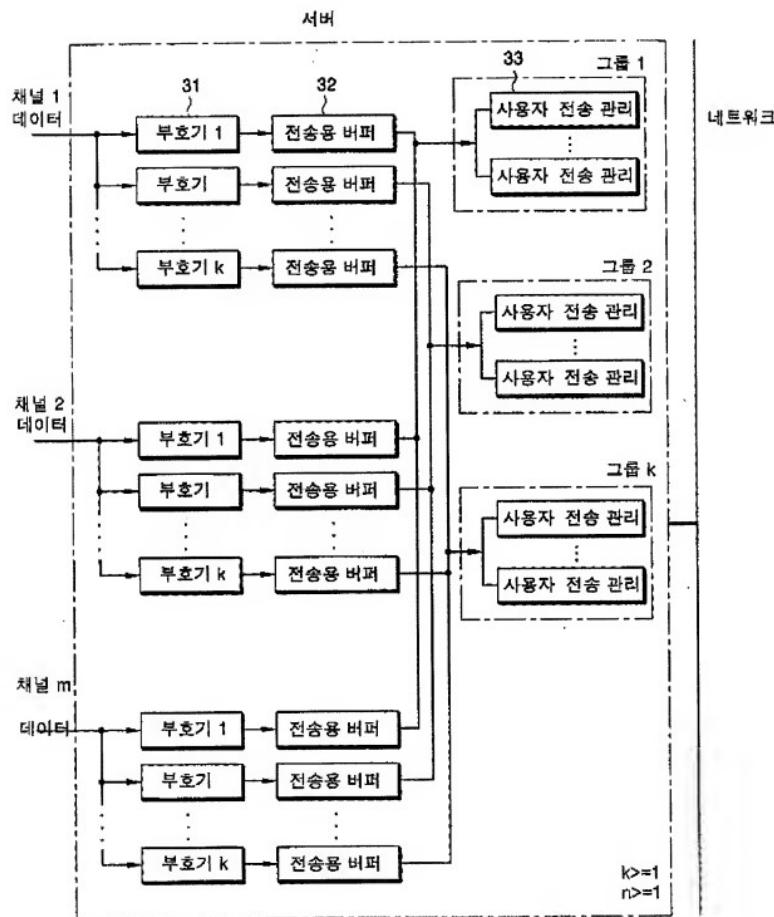
■ Fig. 1



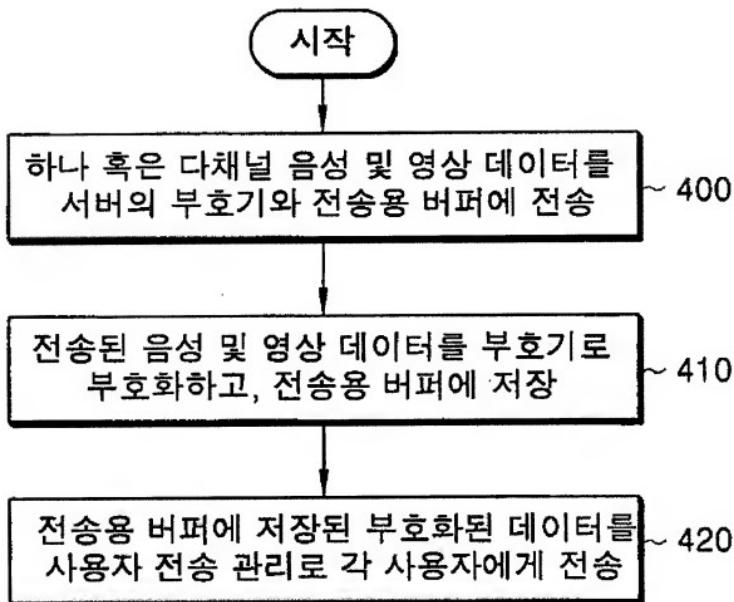
■ Fig. 2



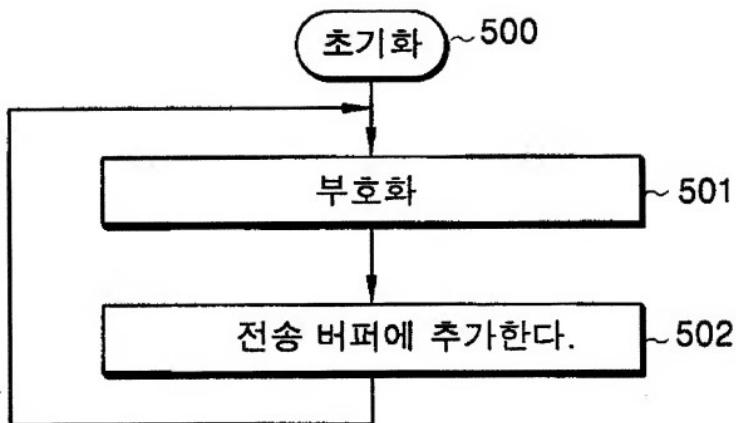
■ Fig. 3



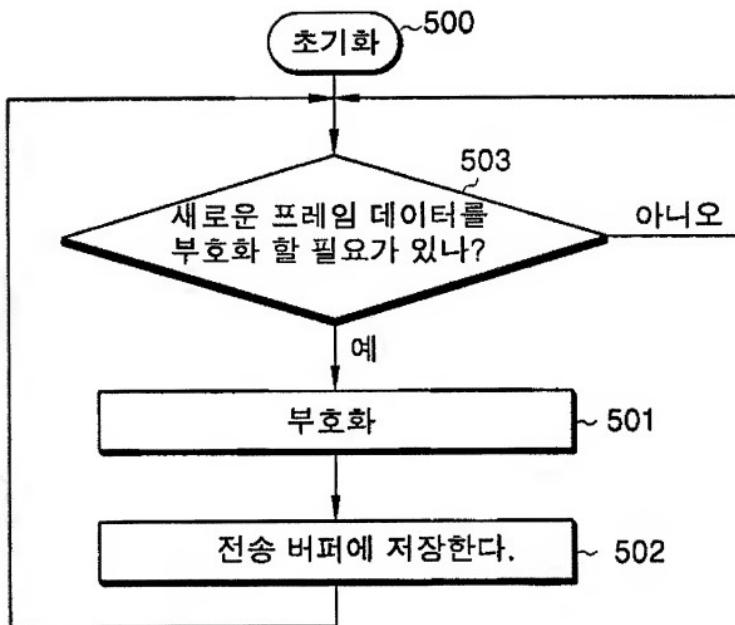
■Fig. 4



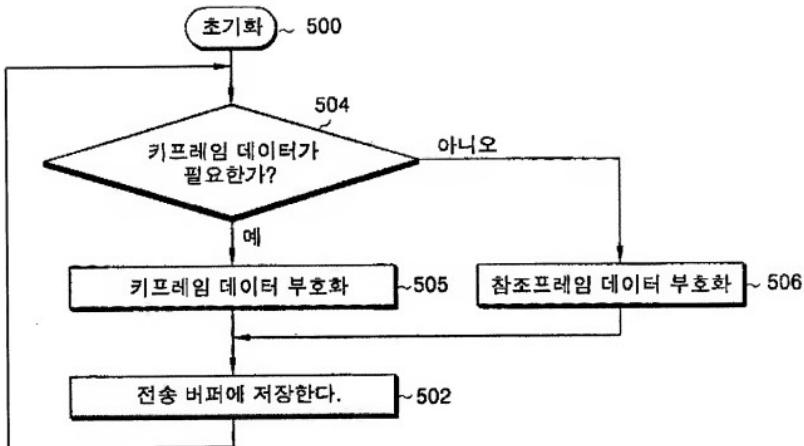
■ Fig. 5



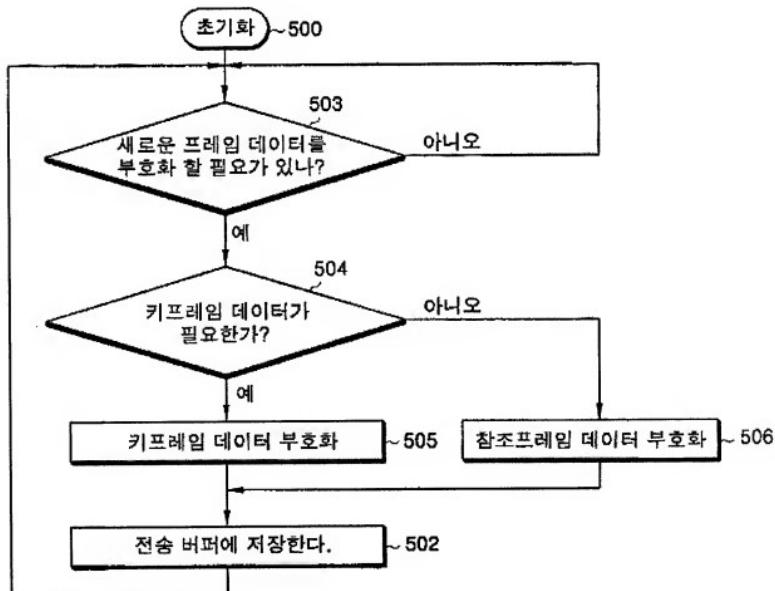
■ Fig. 5a



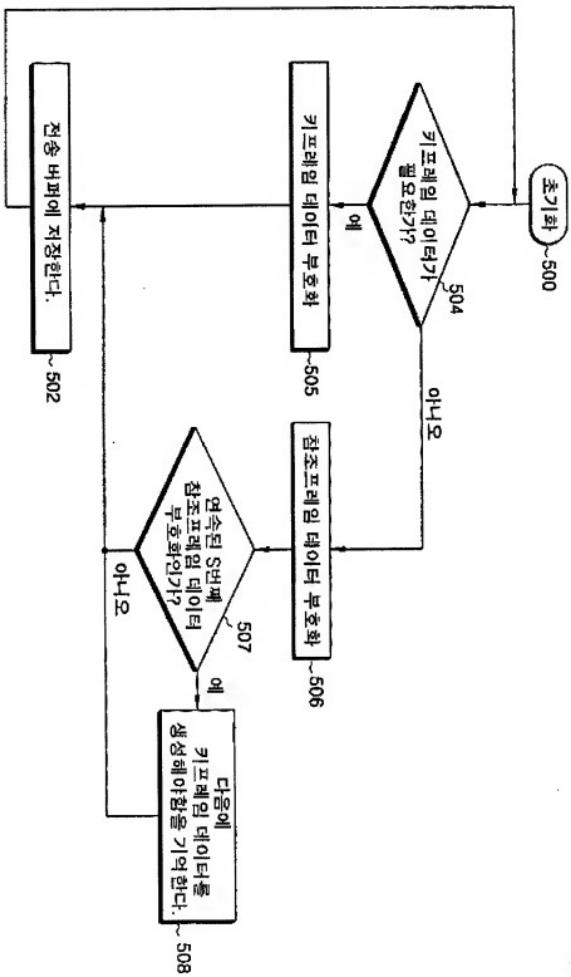
■ Fig. 5b



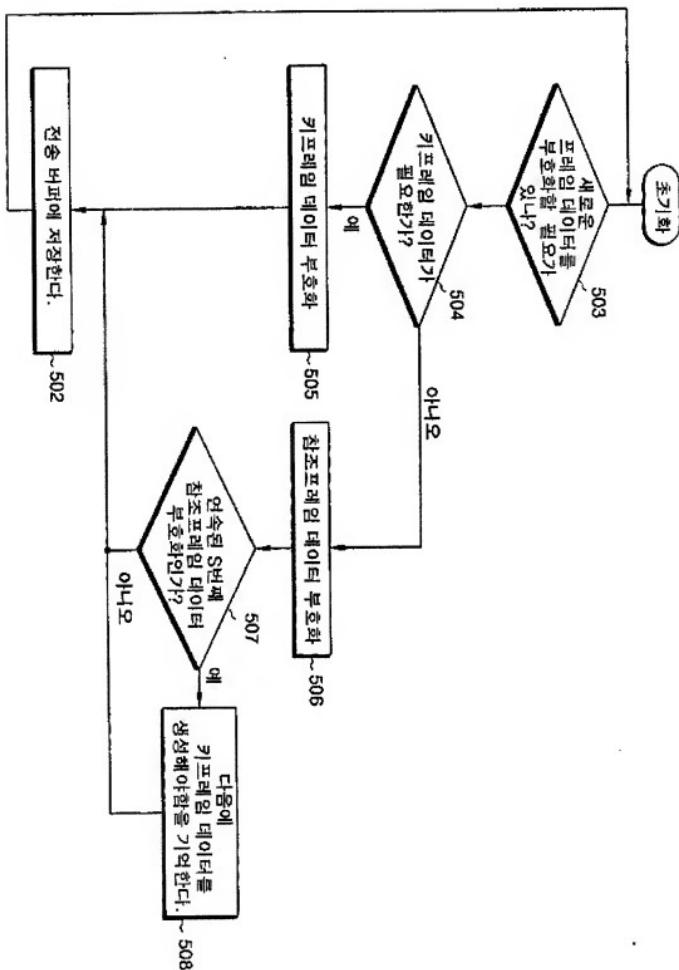
■ Fig. 5c



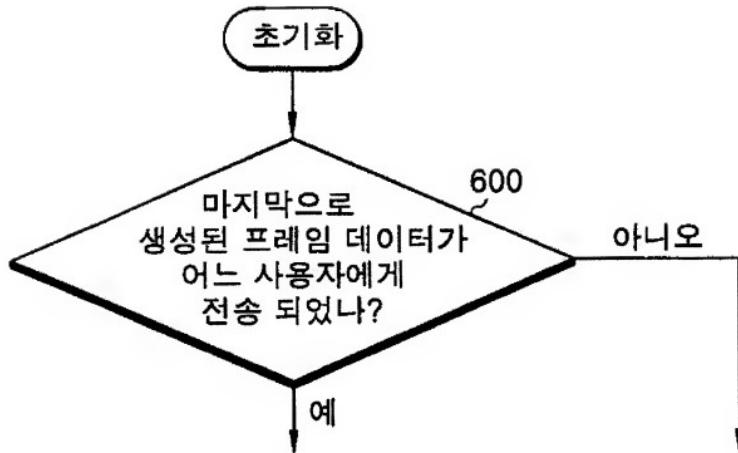
■ Fig. 5d



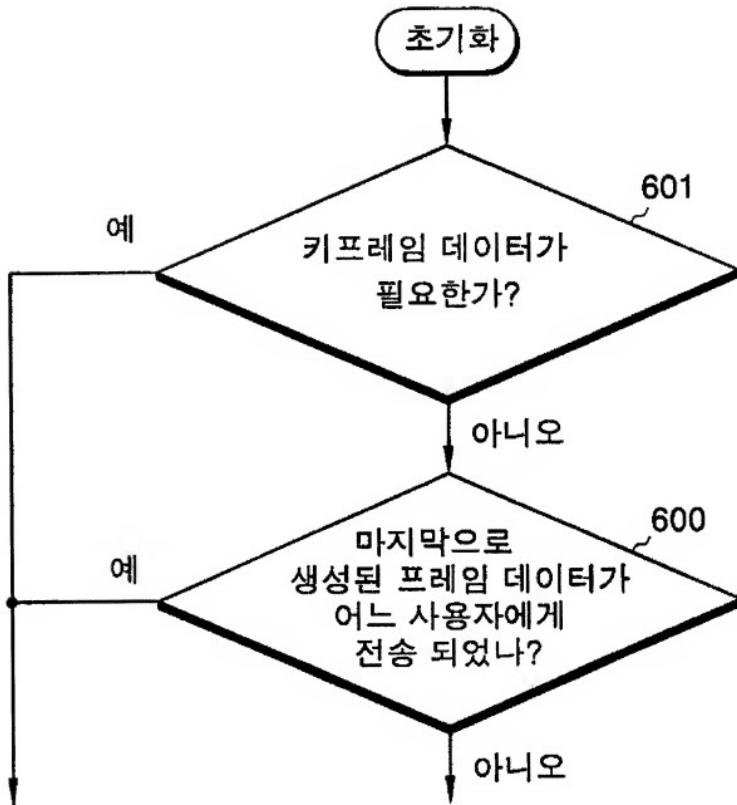
■ Fig. 5e



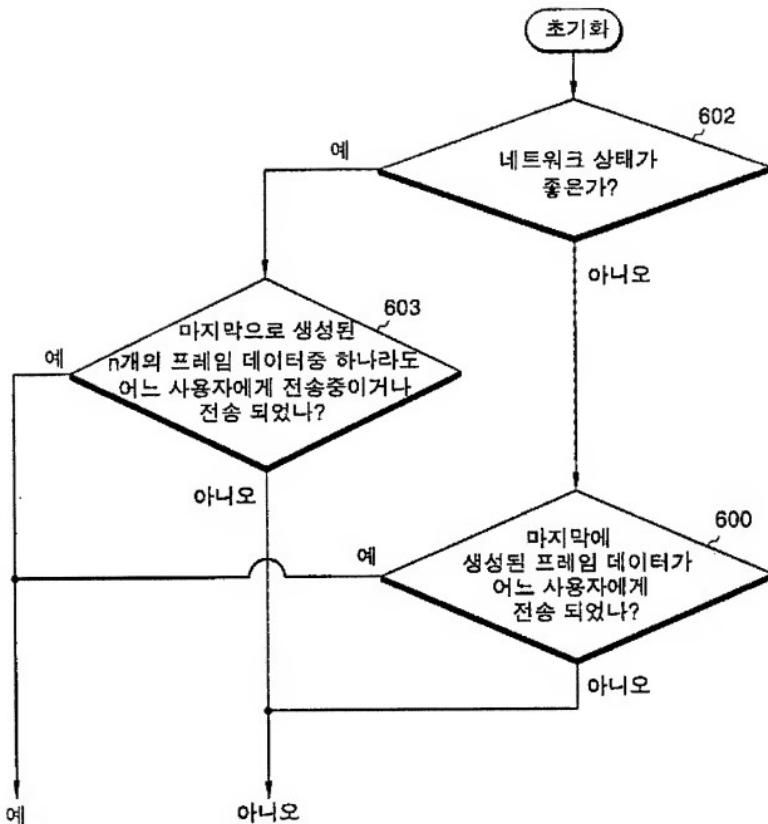
■ Fig. 6



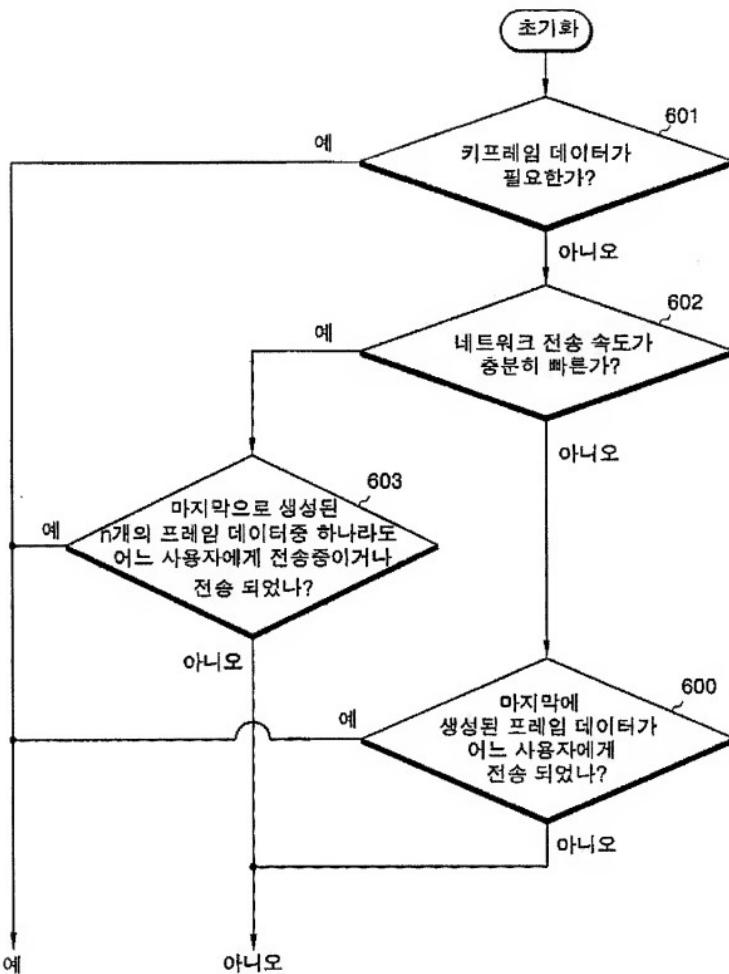
■ Fig. 6a



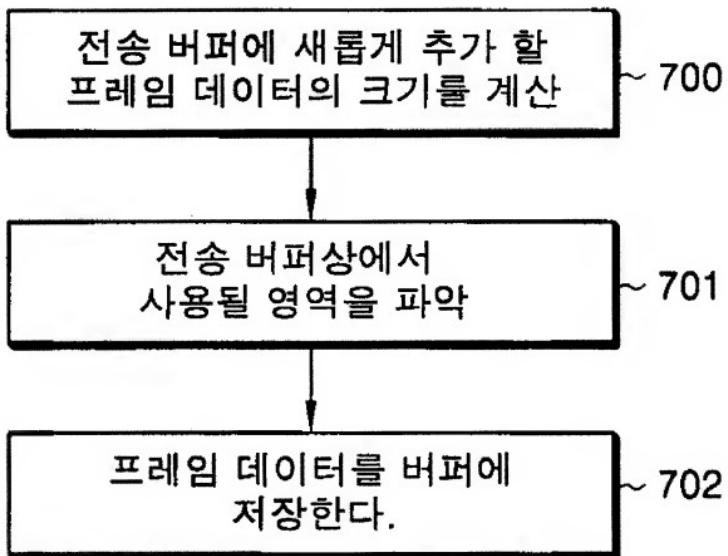
■ Fig. 6b



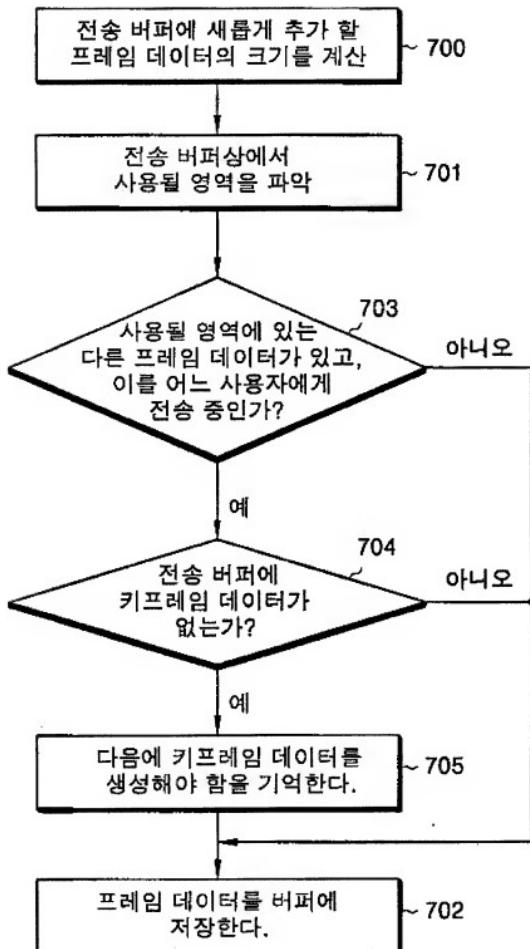
■ Fig. 6c



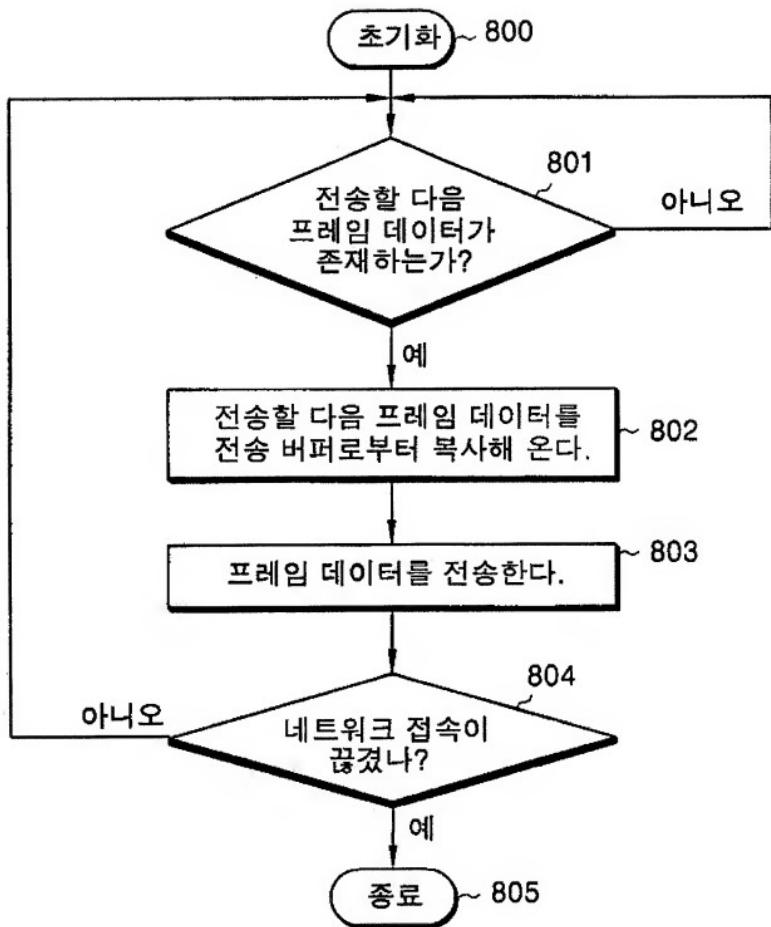
■ Fig. 7



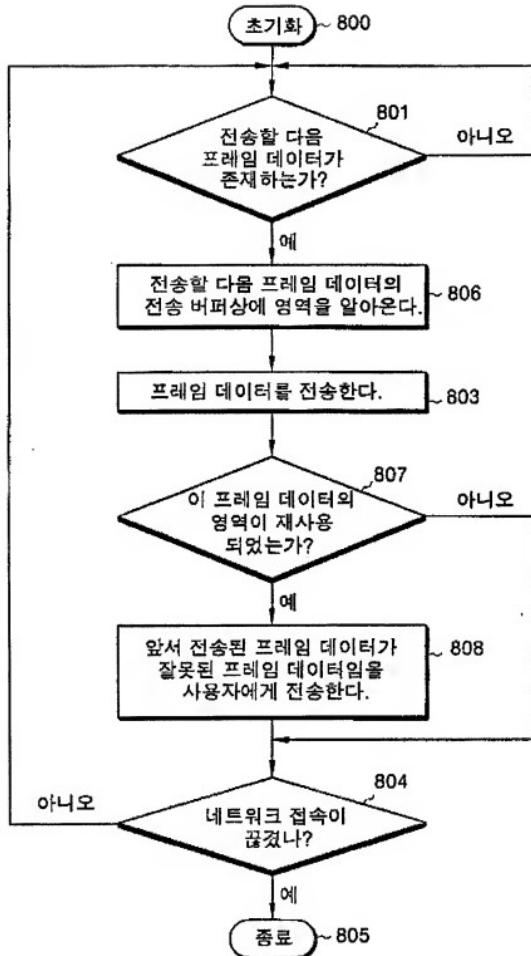
■ Fig. 7a



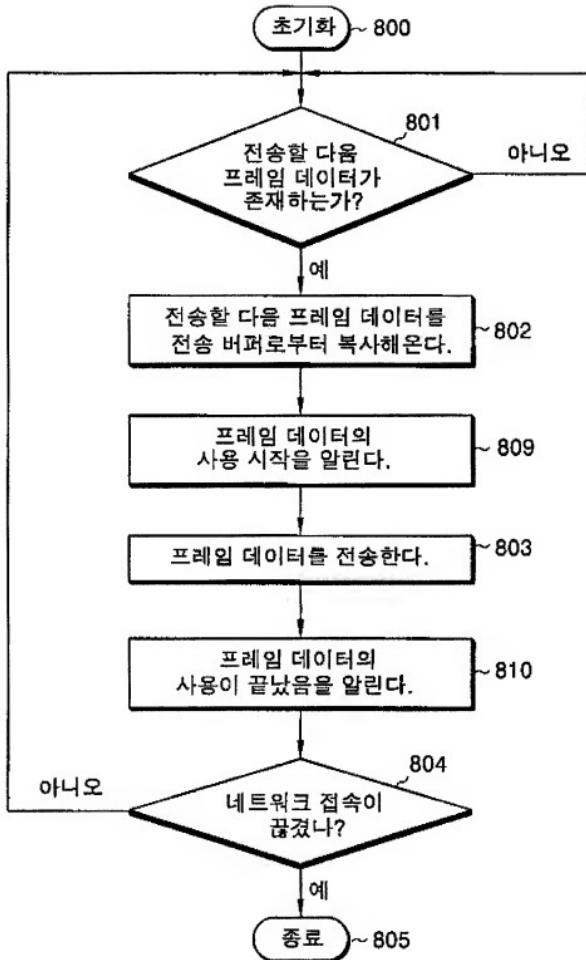
■ Fig. 8



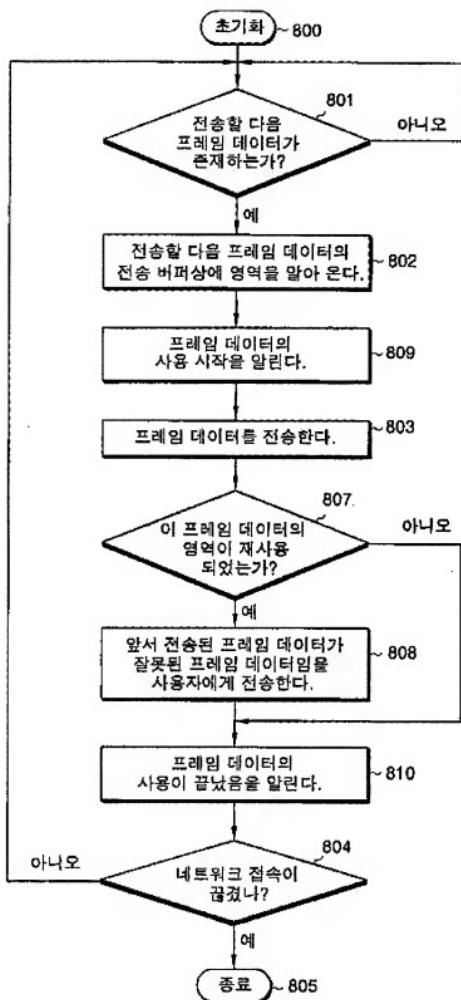
■ Fig. 8a



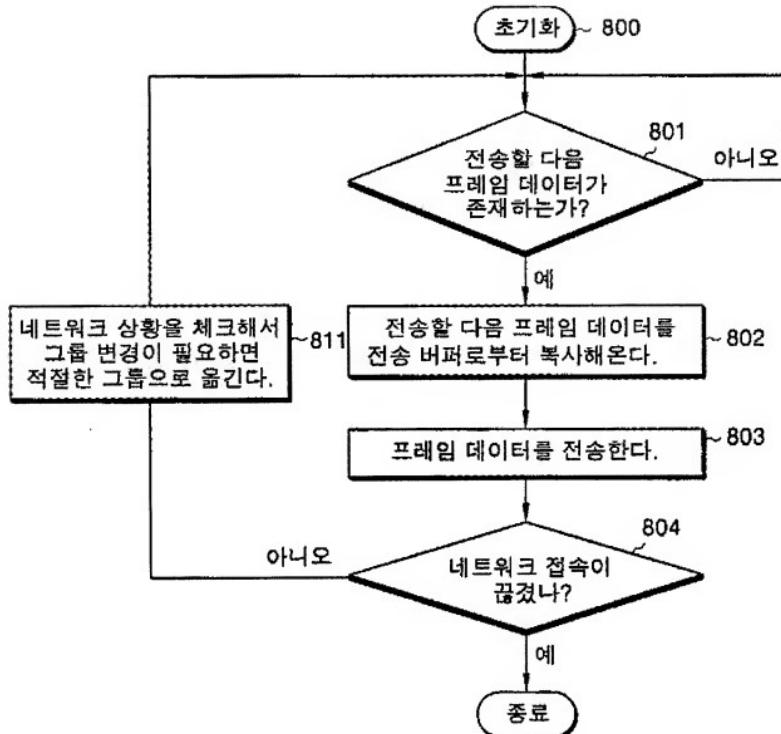
■ Fig. 8b



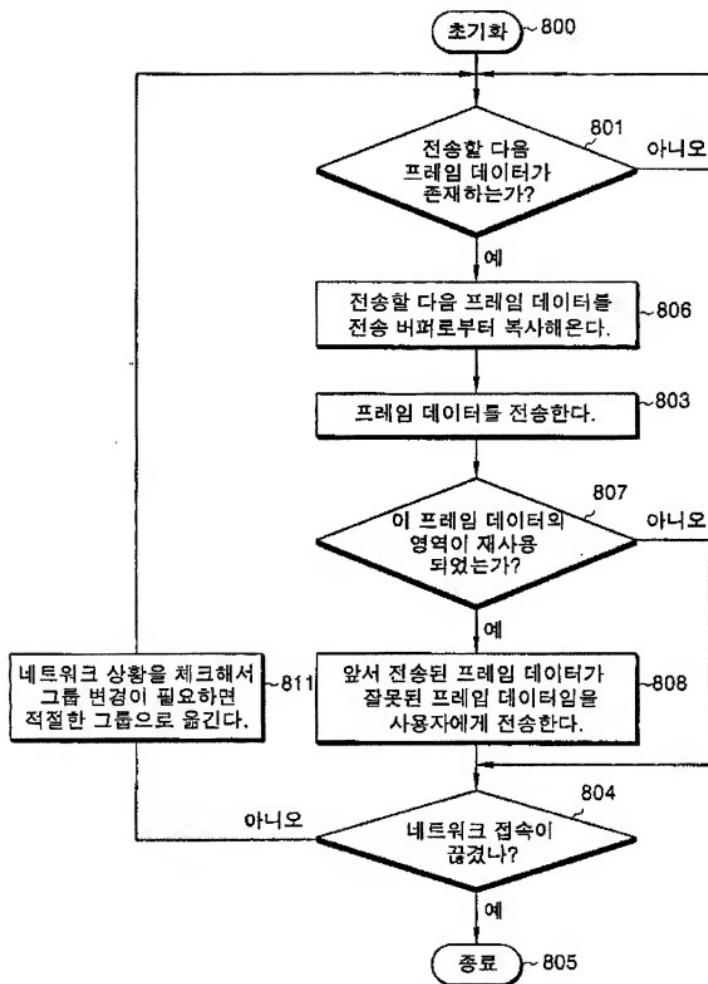
■ Fig. 8c



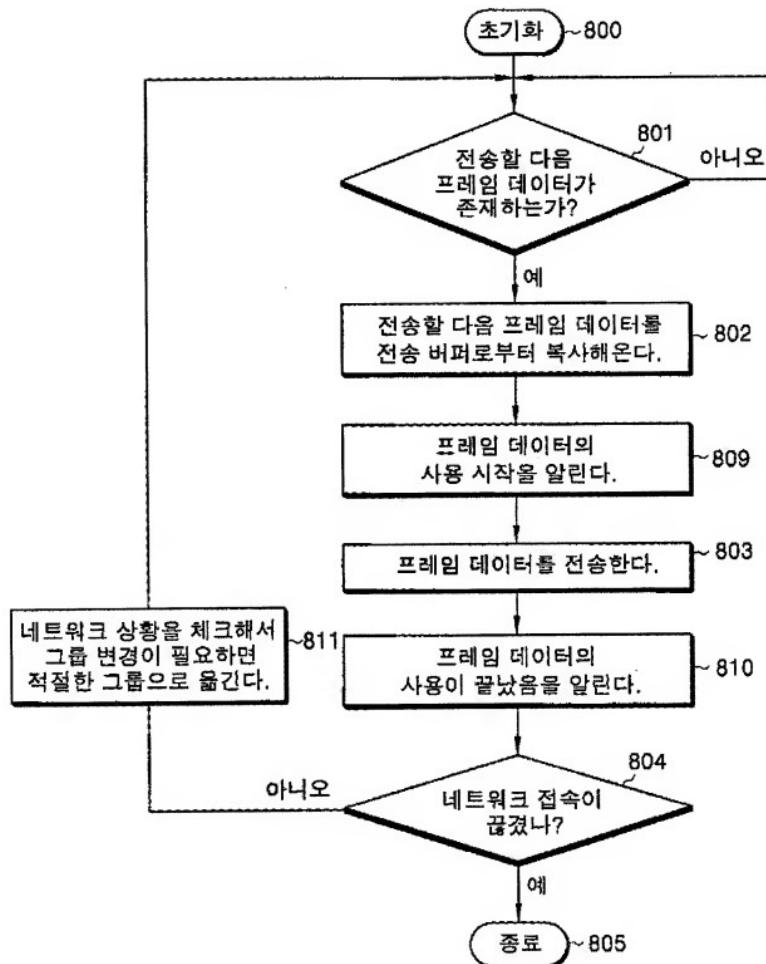
■ Fig. 8d



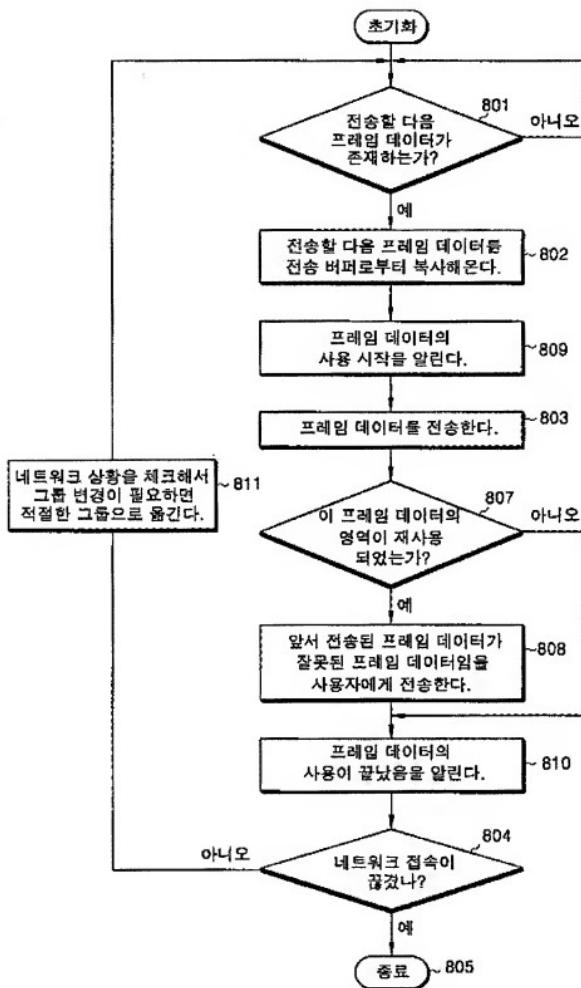
■ Fig. 8e



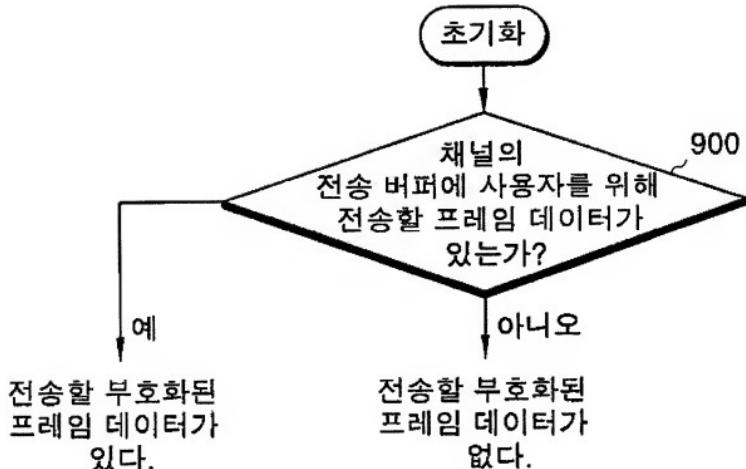
■ Fig. 8f



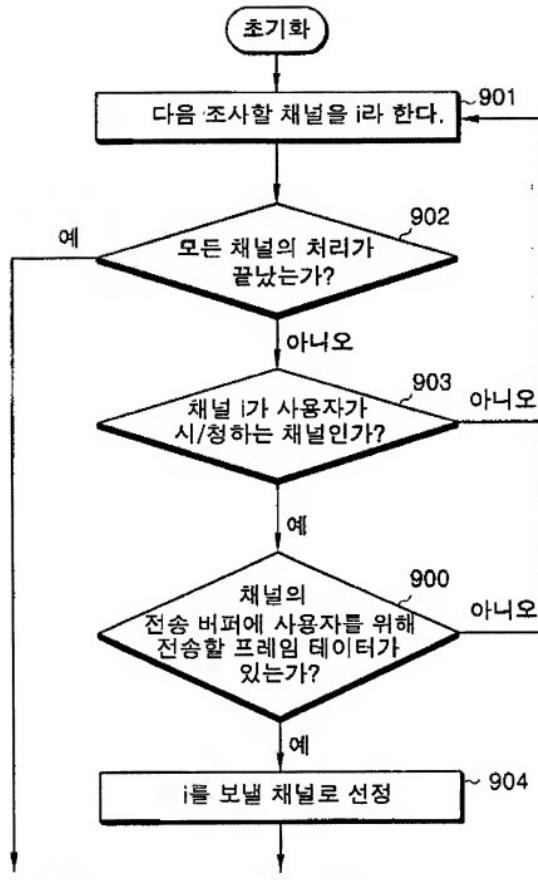
■Fig. 8g



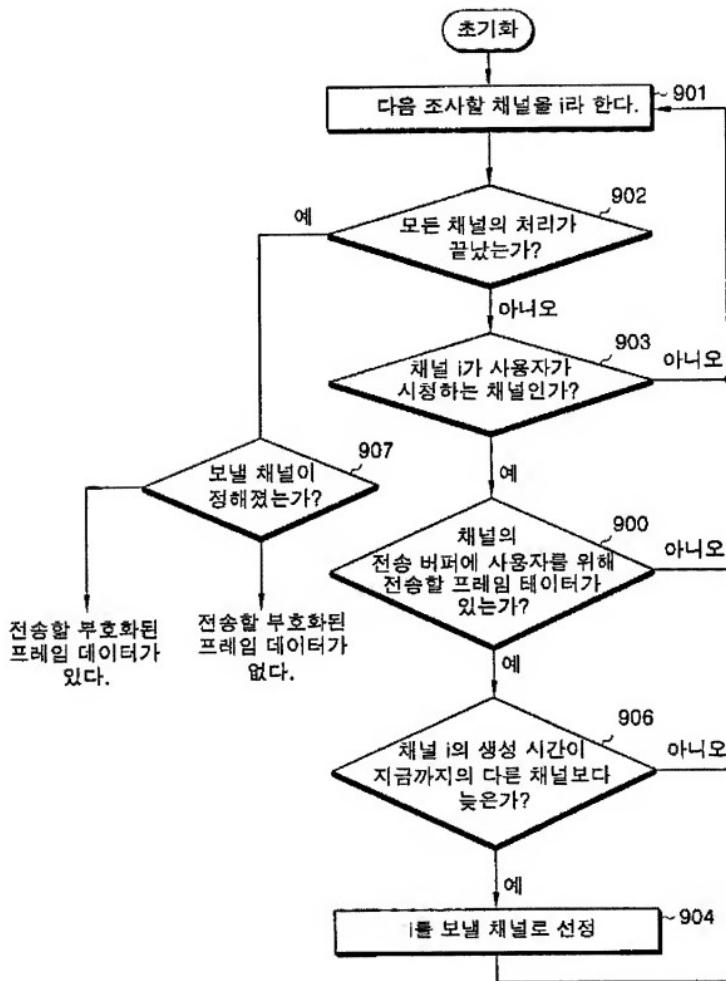
■ Fig. 9



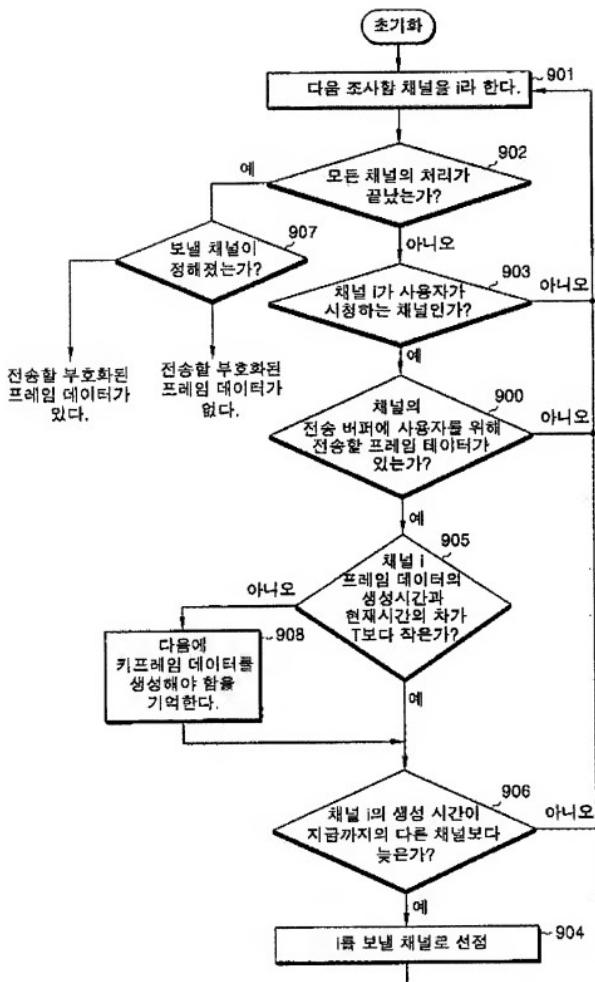
■ Fig. 9a



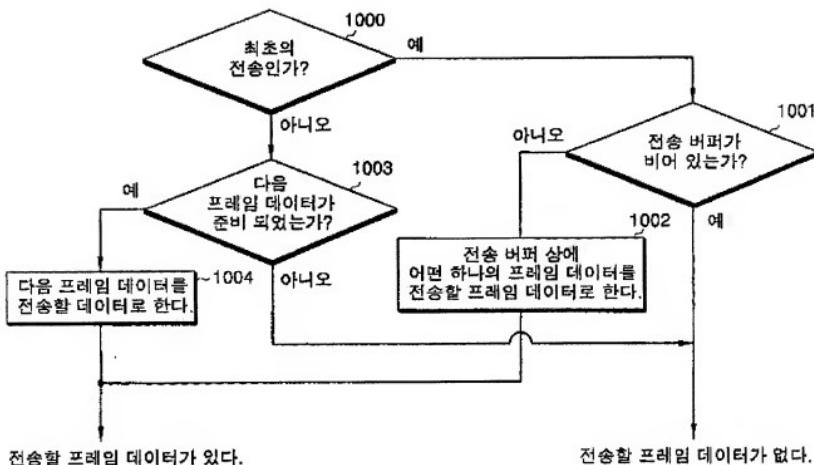
■ Fig. 9b



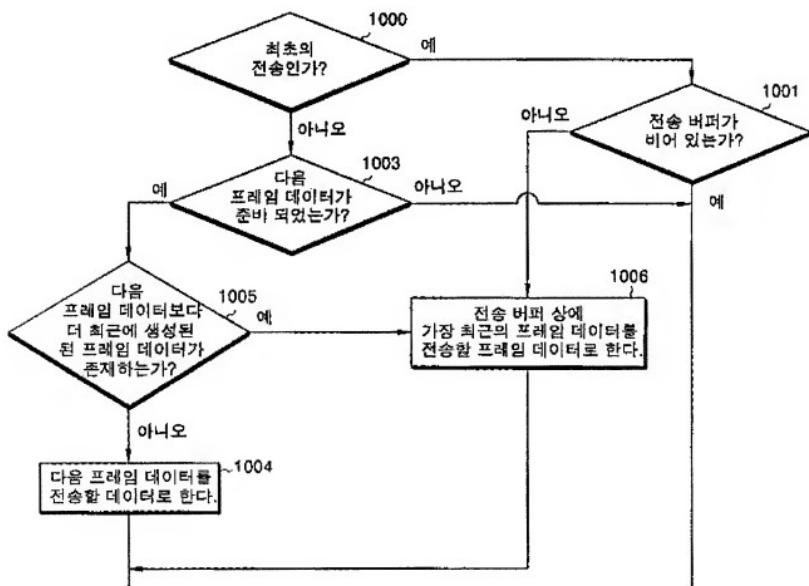
■ Fig. 9c



■ Fig. 10



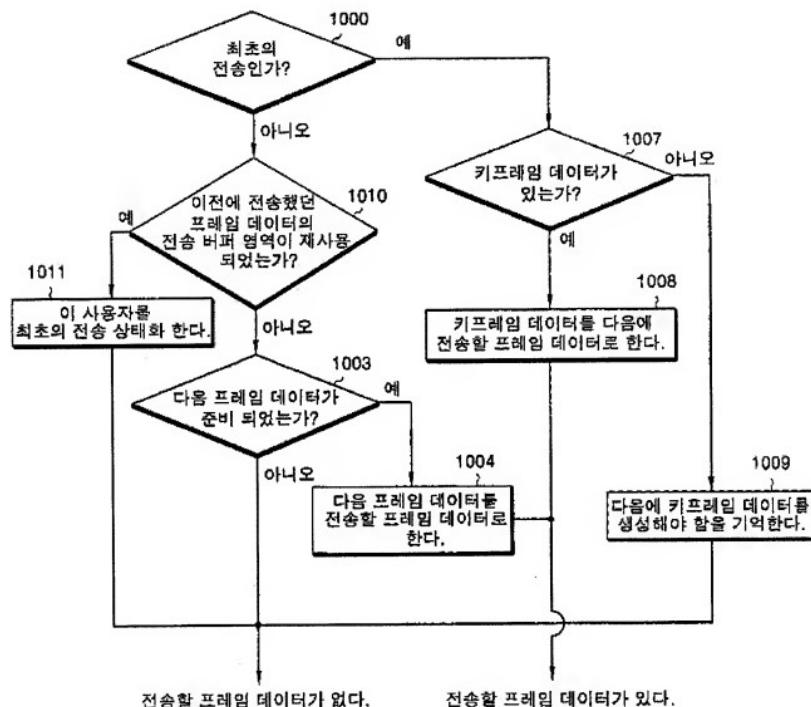
■ Fig. 10a



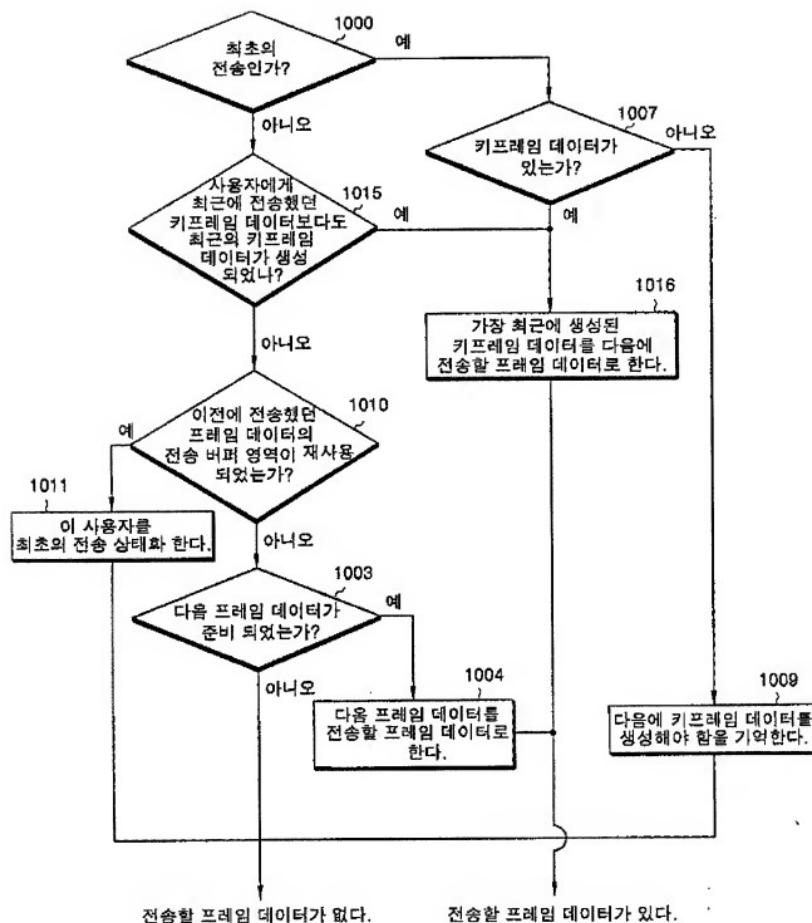
전송할 프레임 데이터가 있다.

전송할 프레임 데이터가 없다.

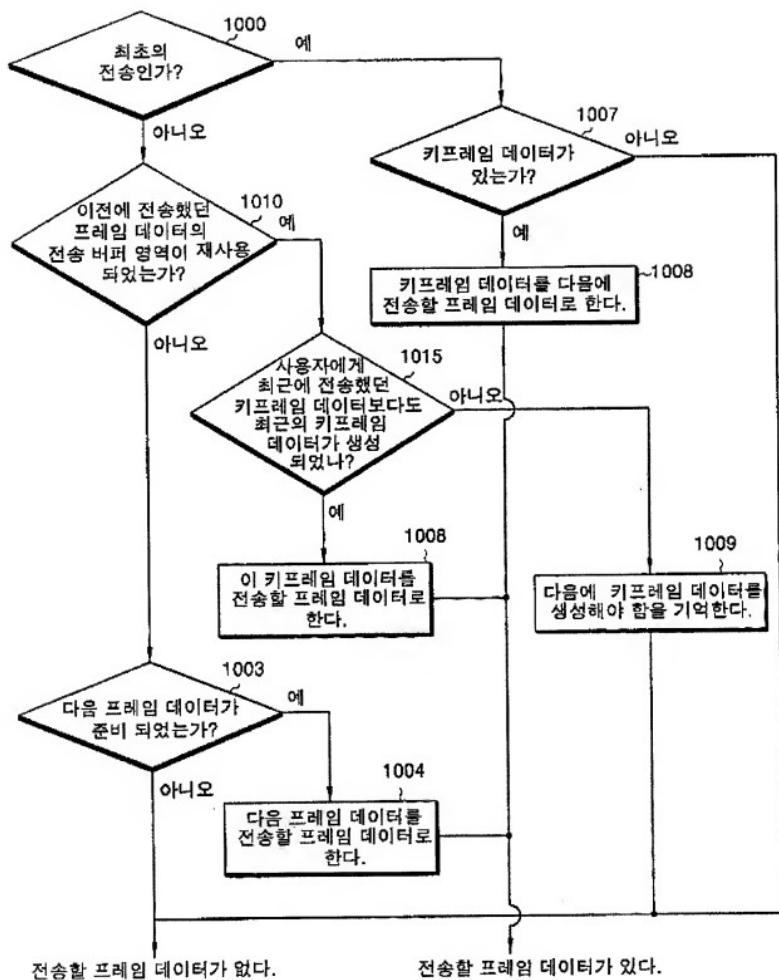
■ Fig. 10b



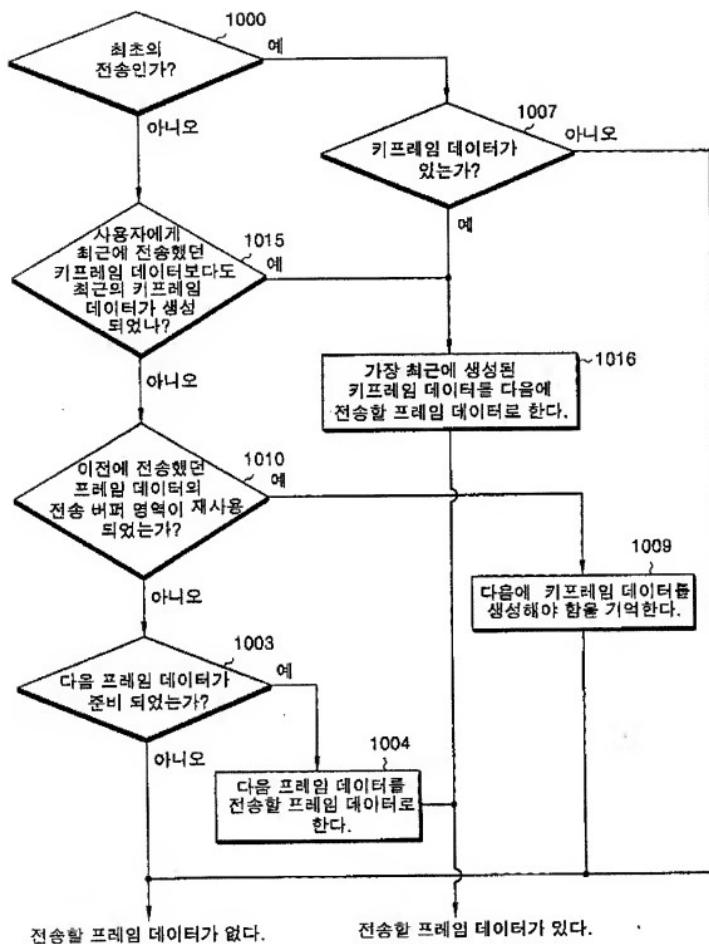
■ Fig. 10c



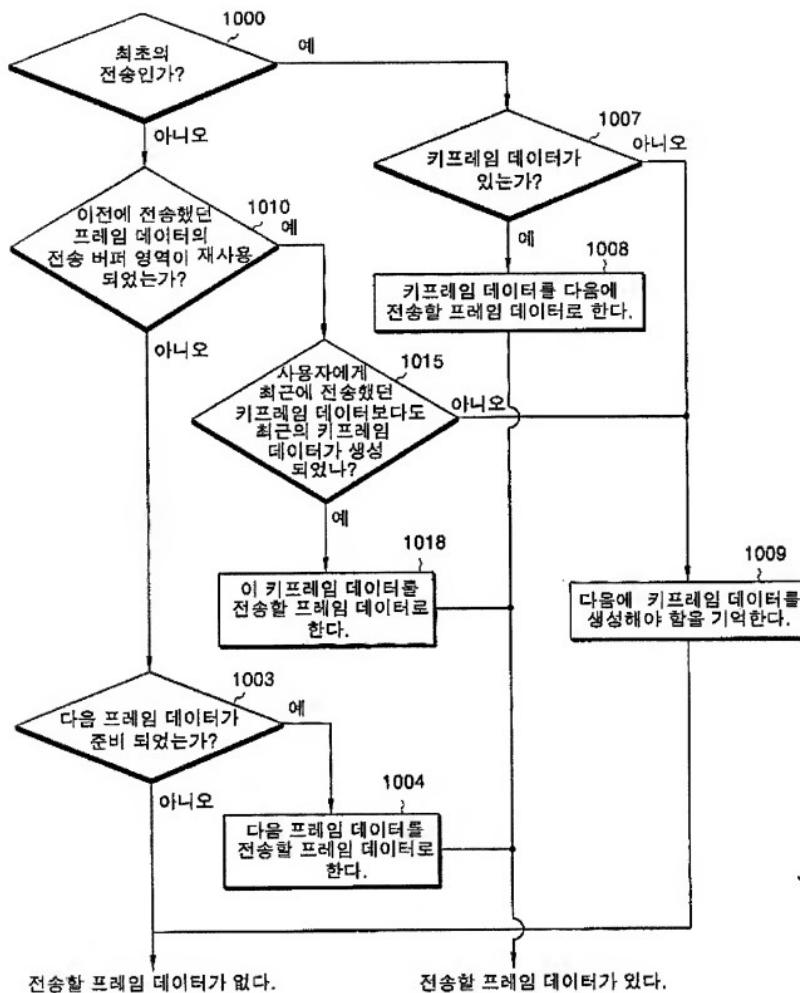
■ Fig. 10d



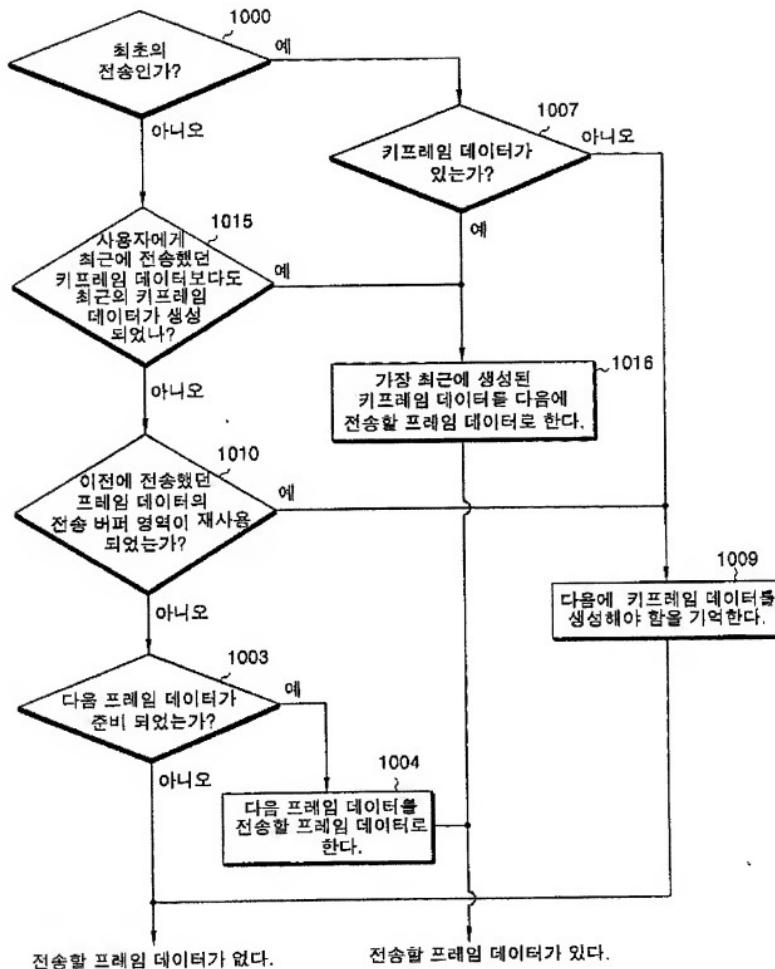
■ Fig. 10e



■ Fig. 10f



■ Fig. 10g

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